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May 1, 2000 Volume 17, Number 18 www.nwfusion.com

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Kevin Tolly is President and CEO of The Tolly Group, a strategic consulting, independent testing and industry analysis organization. As a leading industry consultant, he is responsible for guiding the technology decisions of major vendor and end-user organizations. The Tolly Group has evaluated virtually every important technology to appear over the past decade. Kevin also writes regularly for *Network World* and other publications, and has been widely quoted in leading business publications such as *Business Week*.

John Gallant

NetworkWorld

John Gallant is Executive Vice President and Editorial Director of *Network World*, one of the fastest-growing publications in the computer/communications industry. With more than 16 years of experience covering this industry, Gallant sets the strategic direction for the newsweekly, which serves 165,000 network IS managers. As Executive Vice President, he also guides Network World Publishing, Inc.'s other editorial ventures.

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- When to use mirror ports, RMON and other mechanisms to isolate, predict and ultimately prevent system failures.
- What combination of bandwidth, aggregation schemes, convergence and rerouting mechanisms is necessary to reach "five 9s" availability.
- How to integrate PBX/telephony functionality with your existing LAN infrastructure to improve customer service.
- The best LAN solutions for small and remote offices.
- How to assess the ability of your servers to deliver near-Gigabit speeds and the impact of OS, bus and CPU considerations on performance.
- The impact of Windows 2000 on your network.

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June 15	Washington, D.C.	Sheraton Premier at Tysons Corner (Vienna, VA)

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CACHE DELUXE Start-up NetScaler's WebScaler box can speed delivery of transactions or pages built on the fly. Page 8.

NOT-SO-INSTANT MESSAGING The IETF wants to light a fire under an effort to standardize instant messaging. Page 10.

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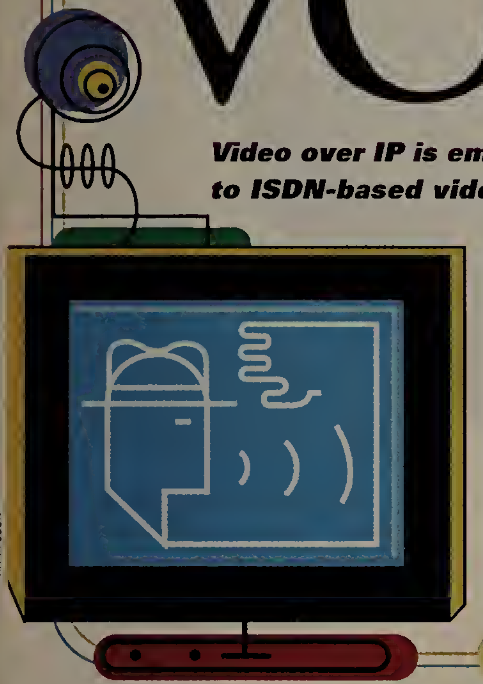
Forgive and Forget?

Will 3Com customers come back to the fold? Page 12.

THE OTHER VoIP

Video over IP is emerging as the successor to ISDN-based videoconferencing.



HANK OSUNA

IP offers cheaper monthly fees and more applications, but QoS questions linger and IP video may require network upgrades.

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IP storage cometh

Competing vendor camps move to define storage-over-IP net standards.

BY DENI CONNOR AND JIM DUFFY

The much-anticipated convergence of storage and network traffic is moving closer to reality through a pair of competing standards initiatives from the biggest names in network infrastructure and a handful of start-ups.

Lucent and Gadzoox this week are expected to announce a proposed specification for tunneling Fibre Channel data through IP networks. The traffic would first be encapsulated in IP by newly developed Fibre Channel to Gigabit Ethernet routers. The companies have submitted a specification to the Internet Engineering Task Force (IETF) that allows clusters of SANs to be bridged

See **Gadzoox**, page 16

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SAN-SATIONAL

Draft: Read the specification for SCSI over TCP/IP.

Working group: See the timeline for work on IP over Fibre Channel.

find it DocFinder 7932 online

DOJ advice: Split Microsoft asunder

BY JOHN FONTANA

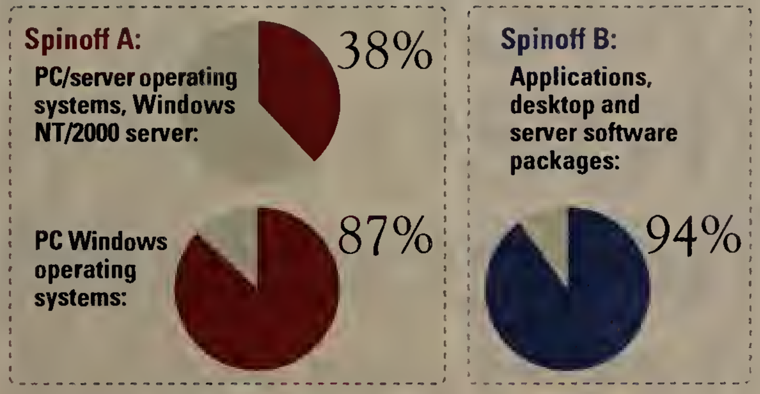
Looking to smash the Microsoft monopoly in the same way it did AT&T 16 years ago, the Department of Justice and 19 states as expected last week asked U.S. District Court Judge Thomas Penfield Jackson to split Microsoft into two competing companies.

The proposal recommended that Microsoft be split into one company focused on the Windows operating system

See **Microsoft**, page 104

Monopoly moves

Even if Microsoft is split up according to a plan proposed by the Justice Department, the applications and operating system spinoff companies will still lead their markets:



SOURCE: IDC, FRAMINGHAM, MASS.; PCDATA.COM

Speeding the last mile

BY TIM GREENE AND DENISE PAPPALARDO

BROADBAND ACCESS BLITZ

Second in a three-part series.

Widespread broadband access is becoming a reality, but it's the last-mile products and services of the future that customers will find most intriguing, industry experts say.

Vendors behind cable modems, digital subscriber line (DSL) technology and fixed wireless services are scrambling to boost the speeds of their technologies and extend services to more-remote business sites. Their strategies include:

See **Last mile**, page 101

Spectrum to get mgmt. boost

BY MARC SONGINI

LAS VEGAS — At NetWorld +Interop 2000, Cabletron's Aprisma spinoff will unveil new management technology to make it easier for users to proactively isolate and resolve critical network and systems problems.

Aprisma will announce Spectrum 6.0, a new, more open version of the company's flagship management package. Among its new features are a Web-based graphical user interface, and support

See **Spectrum**, page 102

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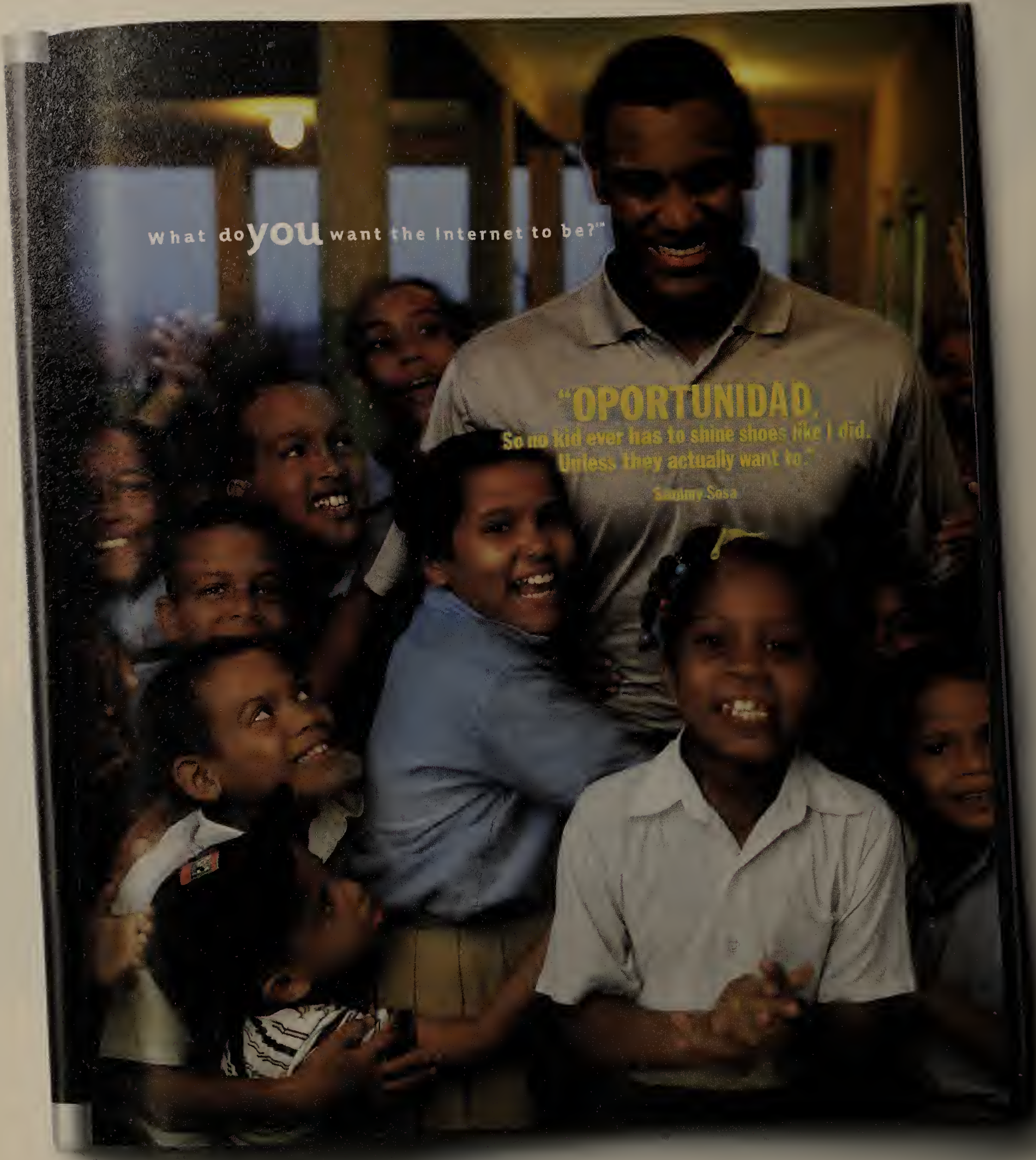
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PARSING WITH PRECISION

The load-balancing market can be confusing, with many options to choose from. We sort them all out. ***Page 63.***

ONE MAN'S QUEST *to pick the perfect load balancer for his company.* ***Page 65.***

JENNIFER HEWITSON/SI

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RESEARCH

Spider Bytes: The Web's best tools and tips

Is caching the best solution for your high-traffic woes? Use our Caching Research Center to find the answer **(DocFinder: 7926):**

- What are the advantages of caching? A white paper from CachExpress outlines them for you.
- There are so many types of caching that it's hard to keep track. Read a Q&A from Vicomsoft to understand the differences.
- Sometimes the only way to learn about something is to try it yourself. Check out a hands-on tutorial from Network Appliance that will help you with the ins and outs of caching.

Newsletters

From the **"High-speed LANs"** newsletter, **DocFinder: 7927**

"At this point, it doesn't look like many businesses will give control over their LANs to outside companies. Most that are considering service providers are thinking of using them for specific functions, rather than entire operations."

Sign up for this and other free e-mail newsletters online at **DocFinder: 3850**

FORUMS

"It takes less time to shop over the Internet than to take a 'long' lunch hour. If we aren't allowed to spend a few minutes to take care of personal matters, [then return my job to] 40 hours per week so I can have time to do these things."

— From the "Rampant Internet abuse?" forum, DocFinder: 7928

SEMINARS & EVENTS

Getting to the heart of ASPs

Do you need help separating fact from fiction when it comes to ASPs? Sign up for the "Network World Reality Check on ASPs" seminar today. **DocFinder: 6928**

BARNEY'S RUBBLE

The best of the NetFlash daily newsletter

MafiaBoy's father busted

As portrayed in "The Sopranos," crime sometimes runs in the family. If you don't believe it, check out the story of MafiaBoy. He's the young Canadian knucklehead who just got busted for launching this year's crushing denial-of-service attacks. Not only does this 15-year-old boy break the law, but his dad does, too. It seems that once the boy was discovered, authorities tapped the family phone and heard the father plotting an assault on a business associate. **DocFinder: 7936**

Defense Department Web-watchers find war plans online

In the old days, espionage was a dangerous game. Spies would enter an enemy country and risk life and limb to gather information. But for some spies today, the biggest risk they face is a browser crash. That's because sensitive information is being tossed willy-nilly onto the Internet. And if you think the good 'ol U.S.A. is too smart to put its secrets on the 'Net, think again. A group of military reservists spend one weekend per month scanning the 'Net, looking for sensitive defense information. And boy, did they find some — detailed maps, plans and top-secret frequencies. **DocFinder: 7937**

Users tell storage vendors to get along

Ever wonder why storage-area networks (SAN) have failed to take off? Blame it on the vendors. According to IT pros in the storage trenches, they would be far more likely to set up SANs if all vendors adhered to standards and if the products were relatively interoperable. Because this isn't the case, users are punishing vendors they only way they know how — by withholding money. It works with my kids' allowances, so hopefully it will work with storage companies. **DocFinder: 7939**

— Doug Barney, executive editor, news

Sign up for this e-mail newsletter online. DocFinder: 3850

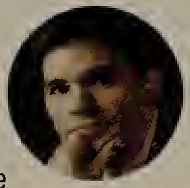
COLUMNISTS

Water Cooler

My-o-Mya

Mya and Ananova. The Web is soon going to be full of these animated, human-like applets reading you the news. Network World Fusion Executive Editor Adam Gaffin wonders what's wrong with using real people. **DocFinder: 7929**

Keeping Current



Free wireless Internet access? Nah!

Rumors abound that free wireless Internet access for handheld devices could materialize by year-end. But after reading a few Palms, Fred McClimans doesn't believe a word of it. **DocFinder: 7930**

Help Desk

Baptism by timeserv

Problem: A reader is installing Microsoft's timeserv application, but is running into a wall. He's getting this message: "The NTP server didn't respond." **DocFinder: 7838**

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NEWS BRIEFS, MAY 1, 2000

MCI/Sprint deal buffeted

MCI WorldCom and Sprint last week were waging a two-front transatlantic war for their proposed merger as criticism continued to roll in. In Washington, D.C., documents filed in the official Federal Communications Commission merger docket revealed that on April 19, the agency's staff "stopped the clock" on its merger review until the companies come up with more data about the long-distance and Internet markets. In January, FCC Chairman William Kennard promised to review the merger within 180 days. But the staff froze the review at day 75, after consultants told the agency's staff that emerging long-distance carriers are not as strong competitors for the Big 3 carriers as merger advocates have made them out to be. In Brussels, a top European Union official announced he has "serious concerns" about the merger, and will send a "statement of objections" to the carriers. Finally, the Economic Policy Institute released a report demanding that Sprint spin off its long-distance operations — including frame relay and ATM — as well as its Internet backbone to gain merger approval with MCI WorldCom.

SEC speaks on hyperlinks

The Securities and Exchange Commission has released guidelines aimed at reducing the uneasiness companies feel about using the Internet to disseminate information. Some companies have been skittish about how securities laws apply to content they provide on Web sites, including content that can be accessed at their sites through hyperlinks. Specifically, the concern is about liability for misrepresentations or omissions contained on third-party sites. The commission confirmed that hyperlinked information could be attributed to a company, but that it would depend on the circumstances. For example, if a company explicitly or implicitly endorsed the information that is hyperlinked, it would raise a question about the company's adoption of responsibility for that information. The context of the hyperlink, the chance that investors could be confused and the presentation of the hyperlink were also cited as important factors.

'The Ciscopranos'

HBO might want this script. According to a report in *The Wall Street Journal* last week, two ex-customers of Cisco allege that two of the company's sales representatives engaged in extortion and death threats against them. Worldwide Web Systems and American MetroComm accuse the sales representatives, who have since left Cisco, of receiving improper commissions, extorting $5 million in payments and threatening acts of violence — even murder. The two deny the allegations and claim Cisco encouraged them to accept fees from the buyers and make investments in their firms, the story says. Cisco filed a lawsuit in federal court in San Jose against its former sales representatives, charging that payments they received were unlawful and were procured improperly, the *Journal* story says.

Bank of America backs CheckFree

Bank of America last week said it will take a 16% stake in CheckFree Holdings for approximately $325 million, while also having CheckFree handle online bill processing for the bank's Internet customers for the next 10 years. Later this summer, CheckFree is expected to complete an acquisition of rival Transpoint, jointly owned by First Data Corp., Microsoft and Citigroup, which will give these three companies a combined 23% stake in CheckFree. In the past week, CheckFree reported a net loss of $3.9 million for the quarter ended March 31, on revenues of $79.7 million.

'Flipper, Flipper, faster than lightning'

A California company has developed a new search technology based on an unusual area of research. Where most search engines use linguistic studies, DolphinSearch has based its technology on — you guessed it — dolphins. Dolphins have a unique pattern-recognition ability they use to identify objects. DolphinSearch uses a model of its namesake's brain as its search engine, which can be used in a corporate or Internet environment. The first product based on this technology will be KnowledgeBox, a network appliance that reads and analyzes documents in a corporate network, so they can be searched for later. KnowledgeBox will be available in the fourth quarter.

AboveNet takes a hit

San Jose Web hosting service AboveNet Communications was knocked out of commission for several hours last Tuesday as its network came under a denial-of-service assault by unknown attackers. AboveNet, which is cooperating with the FBI to bring the culprits to justice, offered scant explanation of its problems, except to say it has taken steps to prevent such incidents from happening again. AboveNet suggested its problems were not because of the type of distributed denial-of-service attack that brought down eBay, Amazon.com and others earlier this year.

NetScaler aims to speed up e-comm

BY APRIL JACOBS

The ability to extend Web-acceleration capabilities from static to dynamic content is the promise of a device that will debut next week at NetWorld+Interop Las Vegas from a start-up called NetScaler.

Dubbed WebScaler, the device works with existing cache and load-balancing hardware to speed access to Web content and Web servers for e-commerce sites. What's interesting about the product is that unlike cache devices, which serve up frequently accessed static content, WebScaler can also speed delivery of dynamic requests such as transactions for sales or pages constructed on the fly. For businesses, that means less waiting time for customers on their sites, and more efficient use of Web servers.

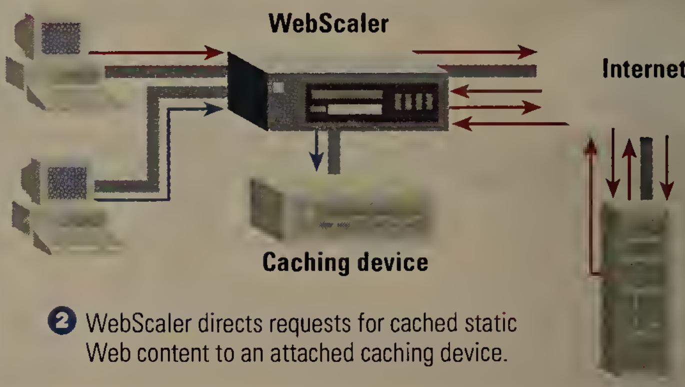
The devices typically sit behind a router and a switch, and in front of a Web server farm. They can also have cache devices attached to them, because they are able to route static requests to those devices. For dynamic requests, WebScaler multiplexes incoming user requests and tags them after serving an initial "hello" handshake. WebScaler then sets up a continuous, or persistent, connection to a Web server, allowing all object requests for content to continually flow to the Web server. Those requests are then sent back to WebScaler and routed back to the requesting user's PC over the Internet, with WebScaler also handling the "goodbye" handshake needed to close the transaction. Handshaking and content delivery traditionally takes place on the Web server in bits and pieces, making the process time-consuming and CPU-intensive. Because WebScaler handles the handshakes and sets up a persistent connection, the

See **NetScaler**, page 12

Scaling Web performance

The WebScaler device speeds delivery of content by deciding if a user is requesting static or dynamic Web data.

❶ Requests for dynamic content that require a high number of transactions (such as a Web purchase) are off-loaded by WebScaler, which completes complex transaction exchanges with the Web server for the requesting PC.



❷ WebScaler directs requests for cached static Web content to an attached caching device.

Be a

Net Know-It-All

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This week's question:

Which had more revenue for its 1999 fiscal year: network products maker Cisco, or food service marketing and distribution firm Sysco?

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Pressure mounts for instant messaging standard

After two years of squabbling, the IETF is stepping-up the effort to standardize the popular online chat technology.

BY CAROLYN DUFFY MARSAN

The Internet engineering community is stepping up efforts to develop a standard communications protocol for instant messaging, the pop-up style of online chatting that is popular with students and gaining ground in corporations as diverse as United Airlines and Compaq.

After struggling for two years to define requirements for an instant messaging standard, the Internet Engineering Task Force (IETF) has asked participants to submit full-blown protocol designs by June 15. This unusual move is meant to jump-start the standardization process, which has been bogged down by bickering over technical details.

Meanwhile, pressure is mounting for the federal government to break AOL's stranglehold on the instant messaging market. Last week, two AOL competitors — Tribal Voice and iCast — accused AOL of monopolistic behavior, and asked the Federal Communications Commission to open up the AOL Instant Messenger system to competitors as part of the approval process for AOL's merger with media giant Time-Warner.

Both the regulatory and technical developments are good news for corporate users, who need interoperability between instant messaging systems in order to roll out large-scale applications.

"Instant messaging without interoperability is the equivalent of trying to listen to your favorite FM station with an AM receiver — it just isn't going to work," says Randy Vaughn, a professor of information systems at Baylor University in Waco, Texas. Vaughn uses Tribal Voice's PowWow instant messaging system to chat with his students and to supplement his office hours.

John Dial, a senior product developer with BMC Software, uses Activerse's Ding software (now owned by Tribal Voice) to communicate with members of his software development team working in remote offices. Dial says BMC's usage would soar if Ding were interoperable with AOL Instant Messenger.

"I've been pushing Ding for a while to our support organization as a really nice private way to hook up to our customers," Dial says. "It would be a major boost if the systems were compatible."

The best bet for interoperability is the IETF's Instant Messaging and Presence Protocol (IMPP), which aims to define a standard way of detecting other users online and communicating with them in real time. The IMPP working group recently finished defining design goals and protocol requirements, but progress has been slow.

At its meeting in Australia in March, IETF leaders took the unprecedented step of putting the working group in "dormant" mode, and halted future meetings until individuals or small groups submit complete protocols. IETF leaders will analyze the proposed protocols and reactivate the working group when it has something concrete to debate.

"I think this is going to speed things up a lot," says Dave Marvit, an Internet strategy consultant with Fujitsu Labs of America and a co-chair of the IMPP working group. "Inviting actual proposals in gives us some clay to work with that we can shape."

For and against

Factions are starting to emerge in the battle over instant messaging standards.

AOL partners

- Apple
- FaceTime Communications
- Lotus
- Novell
- Sun-Netscape Alliance

Blocked by AOL

- AT&T
- iCast
- Microsoft
- Prodigy
- Tribal Voice
- Yahoo

A Massachusetts Institute of Technology researcher has submitted one protocol, and developers from Microsoft and Tribal Voice are working on alternatives. IETF leaders expect to have several proposals by the June 15 deadline and will resume work later this summer.

"We have been working on interoperability with other vendors, including Microsoft, AT&T, Lotus and Fujitsu, for a long time," says Steve Sigler, vice president of corporate development at Tribal Voice. "The business customers want interoperable products, and they're going to get them sooner or later."

In addition to working on standards, instant messaging vendors are going to Washington to try to solve their problem of AOL blocking traffic from rival instant messaging systems. With 120 million users of its AOL Instant Messenger and ICQ products, AOL accounts for 90% of the instant messaging market.

For months, AOL has been engaged in a cat-and-mouse game with Microsoft, AT&T and Tribal Voice over instant messaging interoperability. These companies have figured out a way to send instant messages to AOL users, and then hours later AOL closes down these paths. The spurned companies see AOL's planned merger with Time-Warner as an opportunity to get the government to intervene on their behalf.

"We see instant messaging as the next wave of personal communications . . . and right now the market is being stifled by AOL," Sigler says. "What the FCC filing is meant to do is raise the awareness for agencies reviewing the AOL/Time-Warner merger that AOL . . . is demonstrating anticompetitive, monopolistic behavior."

Although it is blocking traffic from consumer-oriented instant messaging services, AOL has signed licensing deals with Lotus, Novell and FaceTime Communications aimed at corporate applications. Lotus recently sold its Sametime offering to United Airlines, which plans to roll out the instant messaging software to 135,000 employees, including pilots and gate agents. Similarly, Compaq's sales representatives use FaceTime's software to provide online assistance to customers making purchases from the Web site.

"As large business use comes into play here, we're going to have more and more pressure to go to open standards," says Neil Starkey, chief technical officer of Sametime and an IETF participant.

Starkey says the trickiest part of designing an instant messaging standard is the security and authentication component rather than the interoperability issues that get all the attention.

"We need to support communication between communities while protecting large companies' confidential directory information," Starkey says. "That's what it takes to make this technology fit for business." ◪

The Scoop

The news behind the news

THE SKINNY ON THE IMPP

The goal of the Internet Engineering Task Force's Instant Messaging and Presence Protocol (IMPP) working group is to define a standard protocol so various instant messaging and online presence applications can interoperate across the Internet.

The protocol must:

- Support millions of users in a multitude of organizations.
- Support mobile wireless access devices.
- Offer controls for observing a user's online presence and communicating with that user.
- Ensure that notification and messages have not been corrupted or intercepted.
- Identify and authenticate users.

In addition to defining requirements for the IMPP, the working group has defined its terminology and outlined the services that will be provided by IMPP systems. Now the working group is turning its attention to designing an IMPP, with a contest under way that allows participants to submit complete protocols to IETF leaders for consideration.

One of the reasons it is taking so long to design IMPP is that the scope of the effort has grown since the working group was established two years ago.

"The initial goal was to get interoperability between the existing instant messaging systems. Now we've got the whole wireless spin that wasn't there before," explains Mark Day, a senior scientist with Sightpath and co-author of several IMPP documents. "What people in the IMPP working group are still grappling with is the intuition that the technologies of instant messaging and presence are tremendously important, and they don't want to do anything to mess it up."

— Carolyn Duffy Marsan

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3Com sees no damage to customer relations

Company shrugs off complaints following exit from large enterprise network equipment market.

BY JIM DUFFY

ANALYSIS

SANTA CLARA — Despite the customer relations fallout from its recent restructuring, 3Com is confident that business will continue as usual.

3Com alienated scores of customers by abruptly canceling three products as part of a March restructuring that saw the company exit the large enterprise network equipment market.

Although 3Com is offering a migration path to Extreme Networks' gear, many customers were angered because they felt abandoned by the company and duped into buying products just days or weeks before they were discontinued (*NW*, March 27, page 1).

Some users on a Network World Fusion Web site forum say it will be difficult to trust 3Com now and are reluctant to do business with the company again. 3Com says it really didn't have a choice.

"What would be the alternative to what we did?" asks corporate spokesman Brian Johnson, who declined requests for an interview with company President Bruce Claflin. Sources say Claflin and 3Com Chairman Eric Benhamou are being "protected" from customers, an assertion Johnson strongly denies.

"Given the fact that [this story is] focused on customers, it's probably best just to let the customers speak for themselves," Johnson says. "It's not the right time and not the right opportunity for us to speak out on this."

Vendors exiting unfruitful markets usually phase out products over several months and give customers at least that much advance notice, analysts say. Eric Hindin, an analyst with The Yankee Group, says 3Com's abrupt method, which caught most users off-guard, may signal the beginning of the end for the company.

> **■ *"Wall Street may give 3Com credit for being no-nonsense, but corporate America may be a little less forgiving."***
>
> Eric Hindin, analyst, The Yankee Group

"What 3Com did was unprecedented" in the annals of customer relations, Hindin says. "Wall Street may give 3Com credit for being no-nonsense, but corporate America will be a little less forgiving. Two or three years from now it could be a business school study in how not to handle customer relations."

3Com's Johnson says the company does not feel it has irreparably damaged its reputation or credibility with customers. Also, 3Com does not expect any repercussions from cutting off its CoreBuilder, PathBuilder and NetBuilder customers.

Johnson chuckled when asked if 3Com feels it can recover from the strong negative customer reaction to its exit from the large enterprise market.

"Yes, we do feel we can recover because we're now focusing on markets and technologies where we're already successful," Johnson says, referring to the consumer, small and midsize business and service provider arenas. Damage to end-user relations will be minimal, he adds, because the discontinued products were the only ones sold directly to customers — 95% of 3Com's other products are sold indirectly, mostly through distributors Ingram Micro and TechData.

Nonetheless, customers of those resellers may be watching the tension between 3Com and its large enterprise base unfold, analysts say.

"One of 3Com's new initiatives is to sell visitor networking gear to hotels," notes Yankee Group's Hindin. "If you're a hotel using 3Com gear, are you going to put any eggs in the 3Com basket as you implement new visitor networking initiatives? I think not."

CurrentAnalysis Analyst Tere Bracco believes 3Com's handling of the large enterprise customer base will impact sales of the company's lower-end wiring closet LAN switches, such as the popular SuperStack line.

3Com President Bruce Claflin was not available last week to discuss customer reaction to recent company moves.

"3Com is going to have a devil of a time recovering," Bracco says. "They have discounted the connection that the high-end enterprise customers had between their high-end devices and their low end. They'll find that when the CoreBuilder customers get a new vendor for their high-end devices, they will use that same vendor when it comes time to replace the low end."

Some 3Com customers say they'd like to continue buying the company's products, but the decision may now be out of their hands.

"We will continue to get the SuperStack line, I guess," says Jack Gammons, LAN/WAN analyst at St. Vincent's Hospital in Birmingham, Ala. "As long as my upper management lets me buy it."

Others are confident, for now, that the SuperStack will not meet the same fate as the CoreBuilder.

"I do intend to continue to buy 3Com gear, primarily the SuperStack 3300 series for the edge," says Dave Kieper, associate director for IS at the University of Wisconsin, Green Bay. "Some of the products that they're still supporting are very viable, very good, solid products. We will replace them when we need to."

Other analysts say the customer-relations ripple effect from 3Com's product cancellations will be minimal. Only 15% to 20% of 3Com's customers use both the CoreBuilder and SuperStack switches, says Frank Dzubeck, president of Communications Network Architects in Washington, D.C.

3Com's Johnson insists the company had the interests of customers in mind when it killed the large enterprise products. But 3Com also had its bottom line to think about.

"We're always going to do the best thing that we can possibly do for our customers, but we have to run a business here," he says. "We weren't succeeding in these businesses."

Still, Gammons of St. Vincent's Hospital wishes 3Com could have handled its exit a little more delicately.

"Just because you're not winning a particular market doesn't mean you just cut it off," he says. "I could see phase-out a little better than just cutting it off. They left me hanging out to dry." ◪

NetScaler,
continued from page 8

time it takes to deliver dynamic content is greatly reduced.

At Cashsurfers, WebScaler devices are already being used in front of some of the company's Web servers. Chief

NETWORLD+INTEROP 2000
PREVIEW

Technology Officer Noah Mapstead says the servers with WebScalers in front of them can handle twice as many requests per second — about 240, vs. the 120 without the devices. Cashsurfers handles between 30 million and 40 million requests per day for dynamic content — ads for sites that users click on to browse for products. "It's a dynamic process and our rack space for Web servers is limited, so if we are able to double their capacity, it's a heck of a deal," Mapstead says.

Dave Schwartz, an analyst DataQuest in Stamford, Conn., says WebScaler is addressing an important e-commerce need — higher performance and quality of experience for end users. Schwartz says NetScaler is first to market with a product that addresses both static and dynamic content requests.

WebScaler will cost about $20,000 when it ships June 8.

NetScaler: www.netscaler.com

Corrections

The "10 companies to watch" Network World 200 feature (*NW*, April 24, page 95), said 2nd Century Communications uses multiservices switches from Convergent Networks. Rather, the company has settled on Siemens/Newbridge MainStreet-Xpress 36170 ATM switches with Terabridge Technologies' PathMinder network intelligence softswitch.

A story (*NW*, April 24, page 29) inaccurately reported the state in which Rhythms NetConnections had reached an interim agreement with US West. The correct state is Minnesota.

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—THOMAS JEFFERSON [FOR THE MOST PART]

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DSL vendors buck RBOCs over fees

Charges for line sharing at center of dispute before Federal Communications Commission.

BY TIM GREENE

Some carriers specializing in digital subscriber line (DSL) have demanded arbitration hearings to determine a fair price for sharing phone lines with local telephone companies.

Rhythms NetConnections last week filed for arbitration in seven key states hoping to speed the process of setting rates for the technology known as line sharing, which allows one company to provide telephone service on a copper line while another company provides DSL service on the same line without interference.

Once implemented, line sharing will mean faster installation times for new DSL services and could generate cost savings for customers, according to carriers.

Big investment

U.S. phone companies are being asked to share their estimated $170 billion worth of installed equipment.

SOURCE: INSIGHT RESEARCH, PARSIPPANY, NJ

The Federal Communications Commission is calling for GTE and regional Bell operating companies, which also offer DSL services, to negotiate line-sharing agreements with their DSL competitors by June 6.

RBOCs seem to want to meet that goal, but differences still remain, according to Christine Mailloux, assistant general counsel for DSL specialists Northpoint Communications.

The differences have led to a joint arbitration hearing between DSL competitors and Pacific Bell in California. Earlier, Covad Communications filed for arbitration in four other states. Northpoint says it may file later. US West has come to an interim agreement with all the DSL providers, and Covad last week reached agreement with BellSouth.

At issue is the fee DSL providers must pay to RBOCs, which own the phone lines. DSL providers contend there should be no monthly fee for sharing a line because it costs an RBOC nothing.

DSL providers accept that RBOCs will charge an initial fee for setting up line-sharing connections. But they contend the connections should cost no more than what they cost when RBOCs lease them separate lines for DSL services.

Rhythms General Counsel Jeff Blumenfeld says some RBOCs are proposing one-time costs for line sharing that are higher than the one-time costs of setting up separate lines.

Once DSL carriers negotiate or arbitrate deals with RBOCs and GTE, they can start offering DSL services based on line sharing.

States will still have to hold hearings and set official line-sharing rates that carriers must pay in each state. The official rates will take longer to set but will override the deals carriers made earlier.

"No state has set a final rate yet. Everyone knows they have to do this, but the devil is in the details," says Covad Senior Counsel Clay Deahardt.

Covad: www.covad.com; Rhythms: www.rhythms.com; Northpoint: www.northpoint.com

Qwest offering unprecedented Web-based management

BY DAVID ROHDE

DENVER — Bolstering its image as a carrier unshackled by legacy systems, Qwest this week for the first time will present users a unified set of Web-based tools to manage nearly all their telecom services.

Qwest today will unveil Qwest Control 4.0, labeling it the industry's first comprehensive multiservice Web-based management platform. It lets users place orders, initiate trouble tickets and perform basic network reconfiguration from a single dial-up interface for voice, data and Internet services.

Qwest Control 4.0 covers Qwest's frame relay, ATM, dedicated Internet access, Web hosting and toll-free services. It also manages Qwest's traditional circuit-switched enterprise voice service, called Qwest VNS.

Users simply dial in to a server cluster in one of Qwest's network operations centers, click on the type of voice or data service they're dealing with at the moment, and choose options such as configuration, trouble management and network-performance statistics (see graphic).

Qwest officials concede that Qwest Control does not have every feature a customer might want. For example, although it provides extensive network performance information for frame relay, ATM and dedicated Internet access, the Web-hosting module does not provide real-time information on page views. And so far Qwest's IP virtual private network (VPN) service is not included in the Qwest Control platform. That's partly because Qwest has yet to roll out a VPN. It only offers customer premises equipment-based dedicated links using Nokia VPN appliances with Check Point firewall software, and is still working on a dial-up alternative with network-based security.

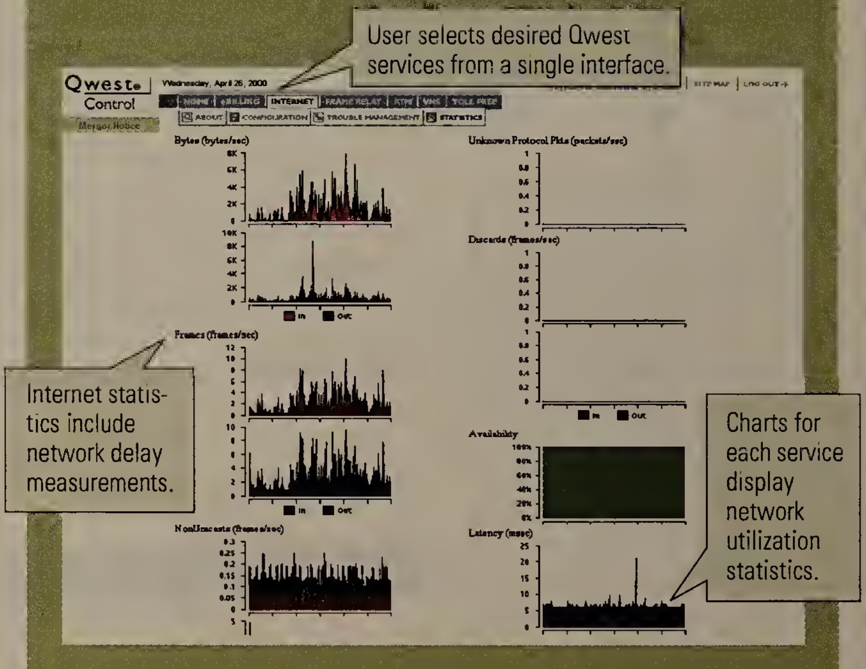
But analysts applauded the range of services that Qwest is making available on a single platform, since the Big 3 long-distance carriers have rolled out Web-based management tools separately for voice, data and Internet services.

"I think this is a phenomenal announcement," says Tom Jenkins, a director of analysis

See **Qwest**, page 16

All-in-one management

Besides parallel order-entry and trouble-ticket applications, Qwest Control 4.0 provides network performance statistics and charts for key services, including dedicated Internet access:



User selects desired Qwest services from a single interface.

Internet statistics include network delay measurements.

Charts for each service display network utilization statistics.

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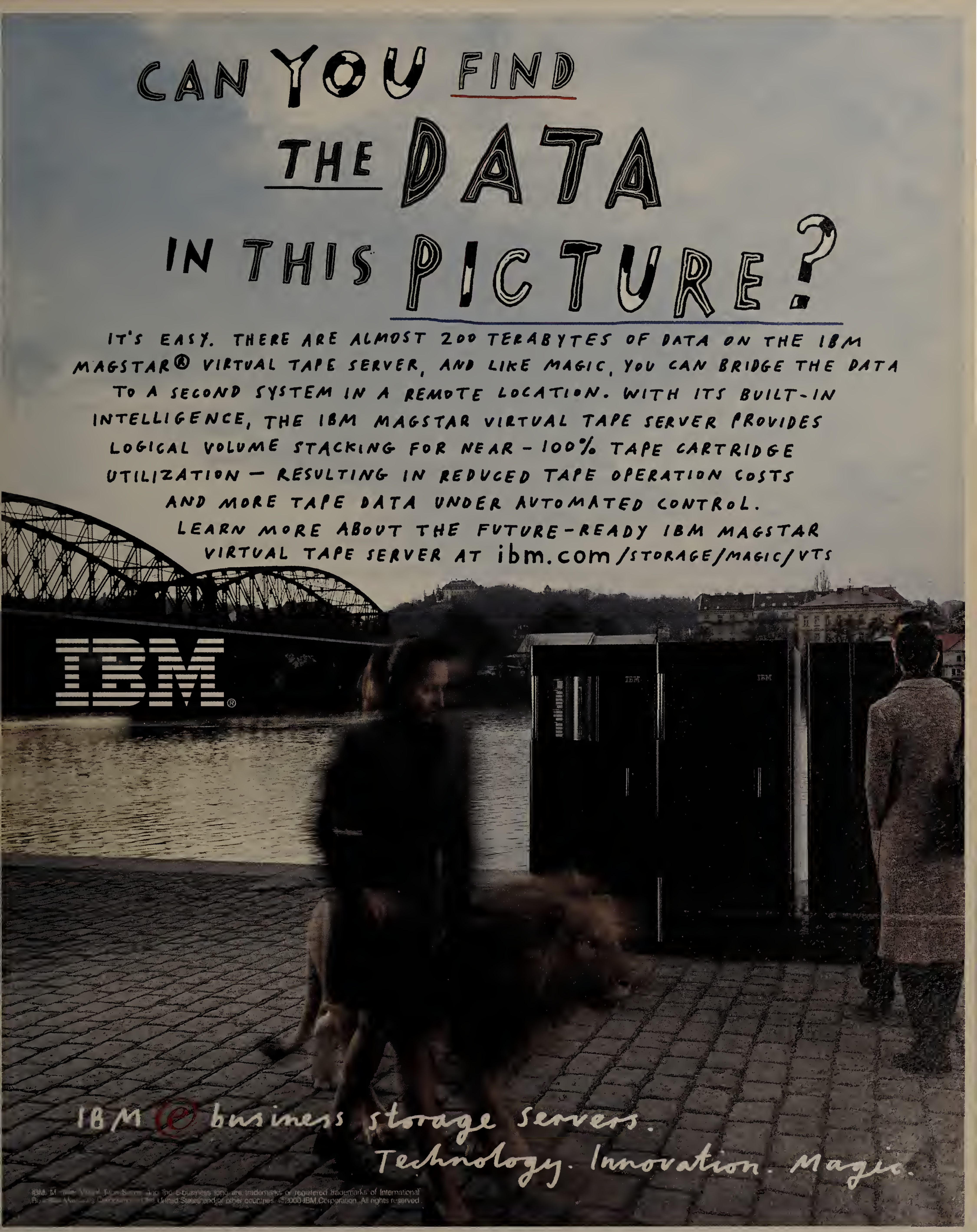

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Gadzoox,

continued from page 1

remotely by LANs, WANs or metropolitan-area networks (MAN). The proposal, which is in an IETF working group, could emerge as a standard late this year, according to Gadzoox.

IBM, Cisco and storage management start-up SANgate say that tunneling Fibre Channel in IP packets alone, while a good way to bridge SANs over long distances via any IP-based network, is only an intermediate step in converging SANs with LANs.

Instead, these companies are promoting the use of SCSI over native TCP/IP, using TCP for the flow control and security they claim Fibre Channel shouldn't have to provide. The trio has submitted a draft to the IETF that has not yet been codified into working group status. Their plans to implement SCSI over TCP are more long range and are not expected to result in any products for at least nine months, says Clodoaldo Barrera, strategy director for storage systems development at IBM.

"The big distinction is not Fibre Channel or SCSI," Barrera says, "it is whether [data] should be sent over TCP/IP or IP alone." According to Barrera, TCP already provides flow control and security, and it doesn't make sense to duplicate these functions with Fibre Channel.

In February, James Richardson, the senior vice president in Cisco's Enterprise line of business, was asked if Cisco would be a player in the storage area network market.

His response was, "Right now it's a Layer 2 game, and we've never done really well at a Layer 2 game. If the market evolves to where there are application requirements for TCP, then I think you'll see our involvement."

He did not let on that Cisco was already involved. A month beforehand, Andy Bechtolsheim, vice president of Cisco's gigabit switching group, was evangelizing Cisco's interest in the market. That month, Cisco jointly submitted with IBM and SANgate, an Israeli company, a proposal to the IETF for running SCSI over TCP. And a Cisco executive joined the board of Nishan, a SAN start-up in Santa Clara.

"We've started to see some interest, rather than deployment plans, for interconnecting SANs across the WAN," says Duncan Potter, a product line manager in Cisco's workgroup business unit. "We're a natural because of our involvement in IP." The current requirement is for SAN interconnection over a MAN, Potter says. But users are looking for a MAN infrastructure with less latency than Fibre Channel, the current SAN technology standard, he says.

Potter became tight-lipped when asked which technologies Cisco recommends for replacing Fibre Channel, only saying the company will be making "broader SAN involvement announcements over the next 12 months." But Cisco's Richardson said in February that he believed 10G bit/sec Ethernet was a natural for that.

Cisco today is expected to announce the Metro 1500, an enterprise wavelength division multiplexer that can be used to provide an inexpensive MAN connection for SANs. But a Cisco spokeswoman says the Metro 1500, which is private-labeled from Adva, is not a strategic SAN offering.

Meanwhile, Bechtolsheim in January made a presentation on "The IP SAN" at the Server I/O conference. Bechtolsheim talked about the possibility of using the IP infrastructure and Gigabit Ethernet or 10G bit/ sec Ethernet to carry SAN data.

Gadzoox isn't slowed by the standardization process, and is expected to show off a Fibre Channel-to-Gigabit Ethernet router at NetWorld+Interop 2000 next week in Las Vegas. This router, code named Black Widow, will allow SANs to connect to each other via a local Gigabit Ethernet network or an IP router from the likes of Lucent, Cisco or IBM.

Users have been reluctant to deploy SANs in major projects because of the newness of the Fibre Channel technology. They are concerned about its interoperability with other devices and the traditional network infrastructure.

"If I had some disparate locations, [Fibre Channel over IP] would be very important to me," says Steve Lopez, architect of enterprise infrastructure and networking for the National Board of Medical Examiners in Philadelphia. "I have some remote sites I do a lot of data collection for. If I could set a device out there that collects data from a TCP/IP-based server and send it as if it were a remote [Fibre Channel] disk, that would be very handy."

Storage vendor Crossroads Systems also plans to introduce Fibre Channel to Gigabit Ethernet or ATM routers later this year. SanCastle, a start-up in San Jose, plans to ship a Fibre Channel-to-Gigabit Ethernet switch in the third quarter.

Computer Network Technology (CNT) previously led the move to SAN/WAN convergence with its ability to transport EMC Symmetrix Remote Data Facility data and other Fibre Channel data over IP using a proprietary technology, which sends blasts of data with only semiregular receipt acknowledgments. Finisar also has had Fibre Channel extenders that allow SAN data to be transported across long distances. The Gadzoox-Lucent specification is the first to use standard protocols for data transport. CNT will move to standard protocol use over the next 12 months, the company says.

In the short term, the IBM-Cisco proposal looks to join geographically separated storage directly to client workstations without intervention of a server or host computer. It would do so by creating a single network adapter that is placed in the workstation, which would access both the IP network and storage on the network. Devices such as cell phones or personal digital assistants would also be able to access network storage in this manner and store the information on compact, ultra-dense disk drives IBM is developing, IBM's Barrera says.

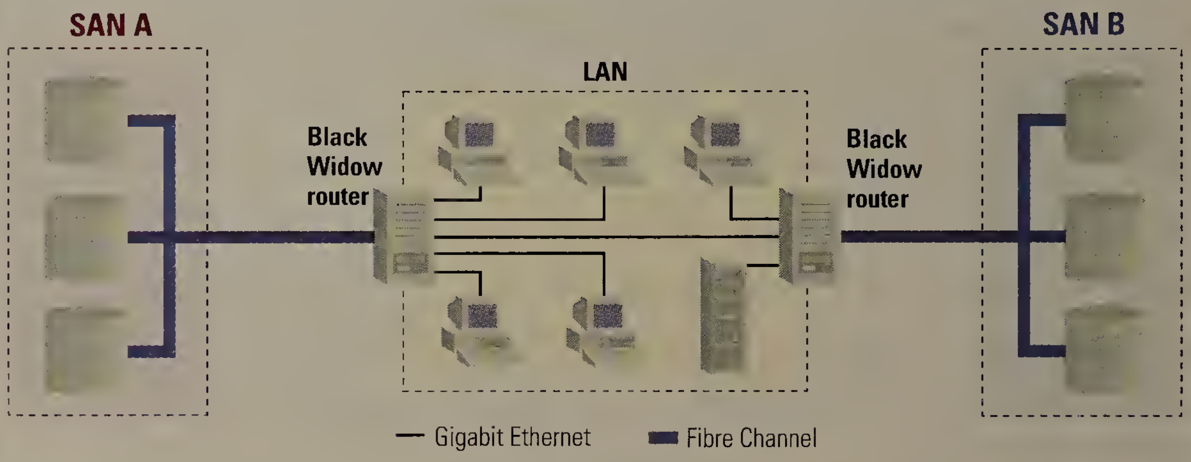
"In the longer run, you can imagine designs where you can create a completely seamless all-TCP/IP network, which consists of a lot of physical networks and all sorts of data," Barrera says. "Far term, companies are going to start making TCP hardware accelerators, and will start to make use of the security and other elements missing in Fibre Channel."

Users say any advance that brings storage data over the network infrastructure is better than what they have now.

"I could mix Fibre Channel and IP together and give data quality of service because my infrastructure already supports IP-based QoS," Lopez says.

SANs across the network

Gadzoox is introducing a Fibre Channel-to-Gigabit Ethernet router (code-named Black Widow) that will allow large companies to integrate separate storage-area networks over a LAN.



Qwest,

continued from page 14

at consulting firm TeleChoice. "I guarantee you that no one else in the marketplace has this."

The roots of Qwest Control go back to Qwest's 1998 acquisition of long-distance carrier LCI International. LCI scored points with the 1997 introduction of LCI Authority, one of the first network-management systems to let users change the level of reserved bandwidth on their frame relay circuits — called committed information rate — on the fly.

The platform was quietly renamed Qwest Control and given the 3.0 designation last year when Internet access and Qwest VNS services were added. The new version adds management of ATM, Web hosting and toll-free services, and introduces electronic billing.

The key to the various Qwest Control releases is a unified customer-management database running on Oracle 8, says Rick Weston, Qwest's senior vice president of product development. Pulling that kind of information together from disparate switching and back-office systems has been a big challenge for older carriers with older systems.

"This does show that an emerging provider has an advantage," Jenkins says. "Some of the other carriers have been much more concerned with getting their internal services from their various mergers talking to each other than in getting them talking to the customer."

Qwest says users can verify their service-level agreements against statistics presented on new and existing versions of Qwest Control. However, many of the statistics only cover the Qwest network and not the local loop. In addition, latency — or average network delay — figures are overall Qwest figures and not specific to each customer's WAN or application, says Mack Greene, Qwest vice president of data product management.

As with many carriers, some of the network reconfiguration options are more order-entry than real-time applications. Version 5.0, which may come out later this year, is expected to include support for IP VPNs, real-time configuration for more types of services and deeper Web hosting statistics. ◪

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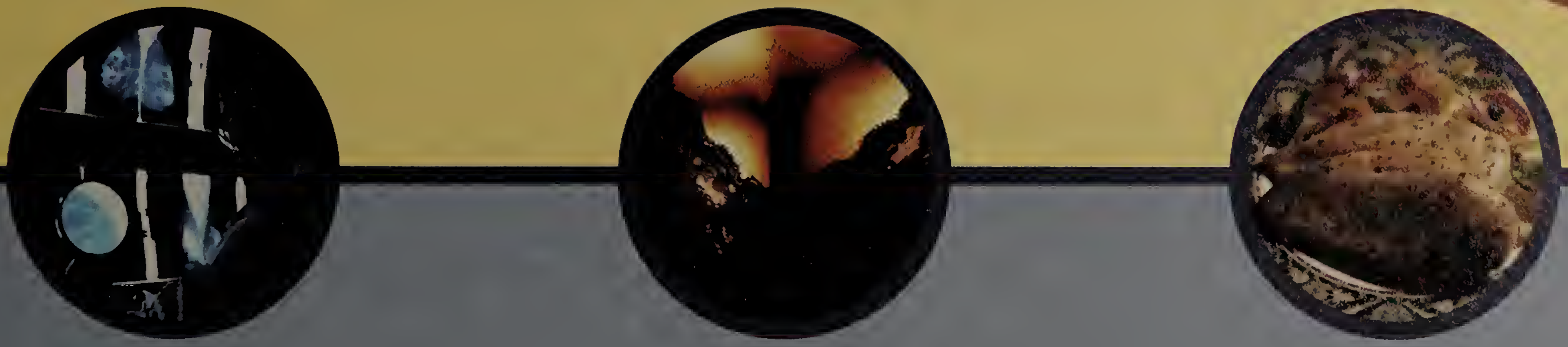

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EMC bolsters Symmetrix storage performance

BY DENI CONNOR

NEW YORK — EMC introduced hardware and software last week that increases the performance and scalability of enterprise storage-area networks (SAN).

The Symmetrix 8000 series storage arrays, the Data General Clarion 4500 Fibre Channel Array and enhanced software are designed for large and midsize SAN customers looking to expand their SANs into the multiterabyte range with more powerful and faster hardware and software. The Symmetrix 8000 will complement EMC's smaller Symmetrix 3000 and 5000, and eventually replace them.

"EMC's existing technology, while certainly good, is relatively long in the tooth," says Steve Duplessie, an analyst with the Enterprise Storage Group in Milford, Mass. "With the Symmetrix 8000, EMC just furthered the gap between itself and its would-be chasers — IBM, Hitachi Data Systems and Hewlett-Packard."

The Symmetrix 8000 is three to four times faster than previous models, the company claims.

One EMC customer says the upgrade is important to his company.

"When we ran Excite's search component with the Symmetrix 3000, performance was at a level that was not acceptable," says Eric Anderson, manager of systems operations for Excite@Home in Redwood City, Calif. "We had to go to the Symmetrix 8000 to attain the level of performance we need."

The Symmetrix 8000 is three to four times faster than current Symmetrix storage arrays, EMC claims. The performance increases are a result of improved internal operating code, new microprocessors, faster memory and doubled internal data buses.

The Symmetrix 8000 is shipping now in two models — the 8400 and 8700. The 8400 scales from 72G bytes to more than 4.7 terabytes of data, while the 8700 has a 19.1-terabyte capacity. Both can simultaneously connect to IBM mainframes and Windows NT and 2000, Linux, Unix and AS/400 networks via SCSI and Fibre Channel.

"Our organization is interested in EMC Symmetrix or IBM Enterprise Storage Server as a centerpiece for a SAN," says Rick Herbert, senior systems administrator for IT for the Commonwealth of Massachusetts. "Our storage needs, primarily database storage, increase continually and the increase in the Symmetrix's performance is attractive as our open systems applications are disk I/O bound."

The Data General Clarion 4500 is a full Fibre Channel storage array that includes software, dubbed Access Logix, which provides secure access control for multiple Sun Solaris, NT, HP-UX or IBM AIX host computers. The 4500 also supports other EMC software and is integrated into EMC's ControlCenter management software framework. ControlCenter allows storage administrators to monitor, configure, control, tune and plan EMC SANs from a central location.

"It makes Clarion useable and gives EMC a viable product in the midrange where before they didn't have one," Duplessie says. "EMC wants every user with previous Clarion equipment to upgrade to full Fibre Channel connectivity."

The Data General 4500 is the first product of the EMC/Data General acquisition that incorporates EMC software for the midrange storage market. It is shipping now.

EMC: www.emc.com

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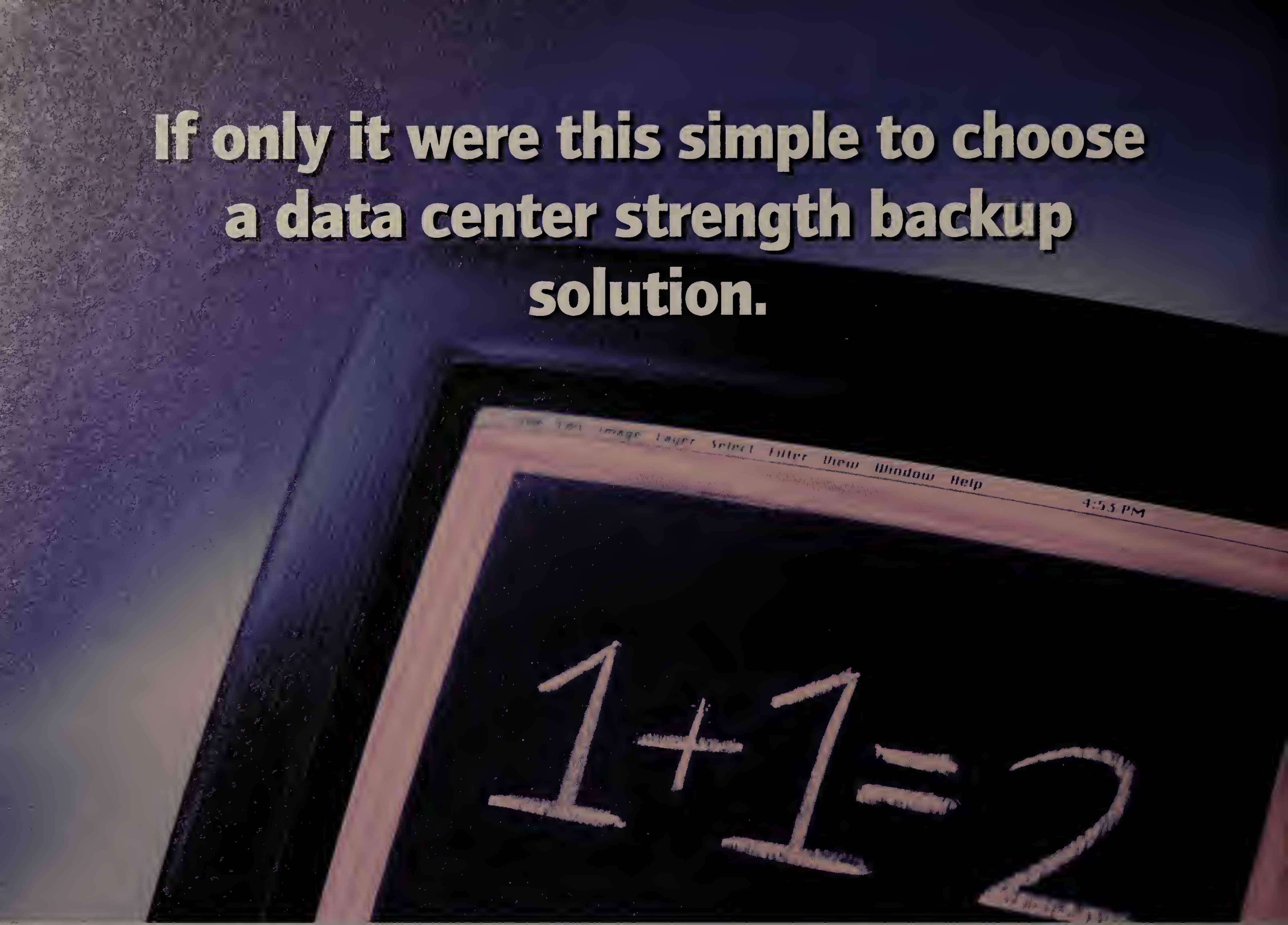
If only it were this simple to choose a data center strength backup solution.
Image
Layer
Select
Filter
View
Window
Help
4:53 PM
1+1=2

	VERITAS NetBackup 3.2	Legato NetWorker 5.5	CA Arcserve 6.6	Ultrabac 5.02
Cumulative SQL7 backup/restore times*	**9 hrs-7min**	9hrs-30min	31hrs-41min	10hrs-30min
CPU Utilization	**7.1%**	7.5%	32%	3.9%
Key Feature Comparisons				
Open file agent, no extra cost	**Yes**	No	No	No
NT server bare metal recovery, no extra cost	**Yes**	No	No	No
Virus scanning, no extra cost	**Yes**	No	Yes	No
56 Bit DES Data encryption option	**Yes**	No	Yes	No
Network Appliance NDMP option	**Yes**	No	No	No
Multi-host library sharing, no extra cost	**Yes**	No	No	No

*From December 1999 issue of SQL Server Magazine benchmarks

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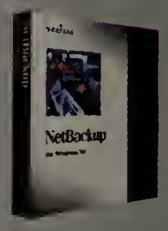
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Infrastructure

TCP/IP, LAN/WAN Switches, Routers, Hubs, Access Devices, Clients, Servers, Operating Systems, VPNs, Networked Storage

Briefs

Novell last week announced a new option for its hosted file services product. Dubbed JustOn Hosted File Services, the "connected caches" feature lets users position Novell Internet Caching Systems locally and quickly access data stored in JustOn accounts from a Web browser. This is one of the first products to come out of Novell's acquisition of Just On.

JustOn Hosted File Services may be used to store files online for collaboration with traveling or disconnected users. A company could store a group of multimedia or broadcast files at JustOn's location for use by its sales representatives.

Hosted File Services is available now starting at $1,200 per month for 20M bit/ sec of consumed data.

Novell: www.novell.com

Allied Telesyn last week rolled out a low-priced Gigabit Ethernet switch aimed at bulking up the backbone for small to midsize businesses.

The AT-9006SX/SC managed Gigabit Ethernet switch has six 1000Base-SX ports and two expansion slots. Optional modules, including 10/100TX ports (four per expansion module) or 100FX ports can be added.

Running in full-duplex mode, each Gigabit port can provide up to 2000M bit/sec of aggregate bandwidth. With six 1000Base-SX ports, the AT-9006SX/SC provides an aggregate throughput of up to 11.8 million packet/sec. when configured with eight 1000BaseSX ports, the company says.

The switch supports IEEE 802.1p Priority Queuing and 802.1Q VLAN Tagging. It is available now for $5,385, or $897 per port.

Allied Telesyn: www.allied telesyn.com

Alcatel fortifies switch QoS

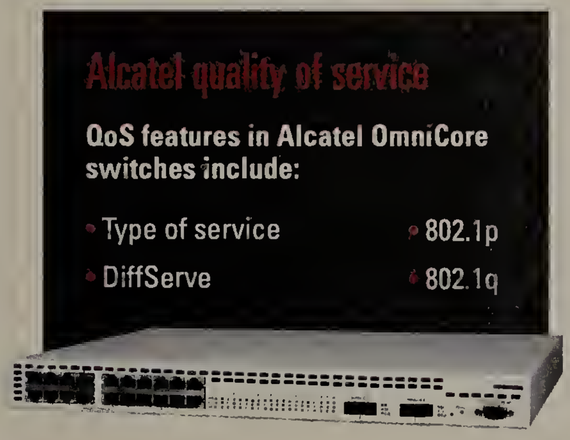
OmniCore 5000 switch can now map service quality across multivendor networks.

BY TIM GREENE

CALABASAS, CALIF. — Alcatel has bolstered the software in its Gigabit Ethernet switches to support quality of service (QoS) even as traffic passes between devices using different prioritization schemes.

An upgrade in Version 3.0 of OmniCore 5000 switch software enables the boxes to impose QoS down to individual applications and map one service quality scheme to another. For example, net administrators could assign top priority to enterprise resource planning (ERP) traffic. The software inspects traffic down to the application layer at wire speed to determine what application-specific policies to apply.

The switches also can map QoS among standardized Layer 2 and 3 QoS methods. Incoming traffic marked for priority by a type of service (TOS) bit — a Layer 3 method — could be switched to a device setting QoS using ATM service qualities, which are Layer 2. The OmniCore switch would make that translation between the TOS designation and the ATM QoS.



Alcatel quality of service

QoS features in Alcatel OmniCore switches include:

- Type of service
- DiffServe
- 802.1p
- 802.1q

This feature lets customers incorporate the switches in multivendor networks with the assurance that QoS can be maintained across all devices, says Raymond Hanson, assistant marketing vice president for Alcatel's internetworking division.

"Having more flexibility with quality of service is key as we add more services. We need the certainty that we can control traffic," says Dennis Schweikhardt, manager of technology infrastructure for Spokane Public School District 81 in Spokane, Wash. The district has 52 OmniCore switches it bought from Packet Engines in 1998. Packet Engines was later bought by Alcatel.

At that time, the Spokane school network required QoS guarantees so it could support voice. OmniCore enabled QoS via Layer 2 prioritization of particular ports on the switches, Schweikhardt says.

As the school district adds more types of traffic, the software will give it more options for setting traffic priorities.

The OmniCore switches already had the processing horsepower to analyze packets and support QoS at Layer 2 and 3. The software enables Application Specific Integrated Circuits in the switches to support QoS at Layers 4 and 7 as well, Hanson says.

Free Version 3.0 software is available now to OmniCore owners with service contracts and ships with new purchases.

Alcatel: www.alcatel.com

Novell tool lets users customize directory services

BY DENI CONNOR

PROVO, UTAH — Network executives will be able to manipulate their directories with a new tool Novell is giving away.

Dubbed ScheMax, the software reads the structure or schema of Novell Directory Services (NDS), maps it and lets customers add, change or delete directory attributes and write utilities to manage the directory or its user, printer or network objects. For instance, NDS contains objects for users called user objects, which may contain details or attributes about the user, such as telephone number, address and user name. ScheMax lets administrators add objects to the NDS schema that are customized to their organization or delete objects they may not use.

"The bottom line is you can tweak the NDS schema and do anything you want with it now," says Gary Porter, network manager for the University of Kentucky in Lexington, Ky. "You can also update information automatically without writing any code."

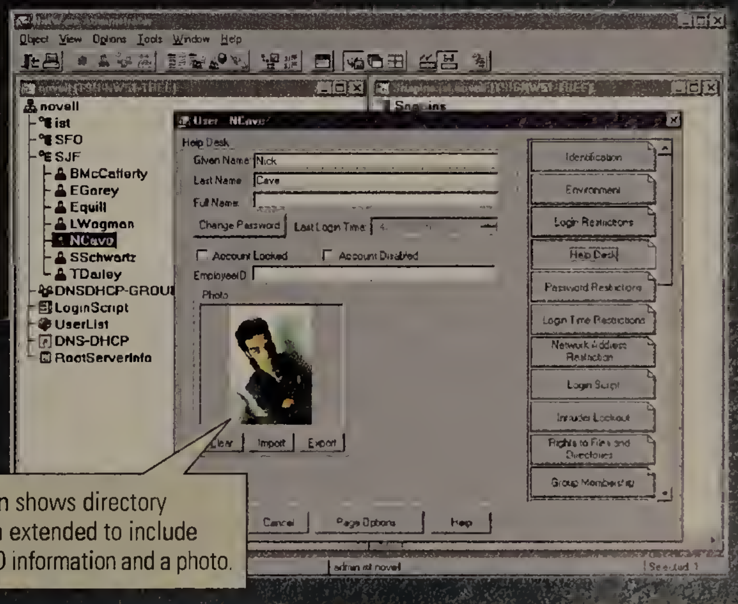
ScheMax also lets users set policies for directory changes and maintenance.

"My interest in ScheMax will lie principally in how well it will help me with routine maintenance in a standard directory services environment, not so much

See **Novell**, page 24

NDS manipulation utility

Novell's ScheMax utility lets you display extensive employee information in a Novell Directory Services interface.



Given Name: Nick

Last Name: Cave

This snap-in shows directory information extended to include employee ID information and a photo.

yet he won't remain online for eight seconds

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he'll wait years for the possibility of baby pandas,
to purchase a 'how to mate mammals' primer.

it's a bear managing a web site, isn't it?

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Stratus brings fault tolerance to Win 2000 users

Company's new ftServer family is designed to prevent failures and offer an alternative to clustering.

BY JOHN FONTANA

Microsoft has been preaching availability as one of the hallmarks of Windows 2000, while Stratus Computer is out to define just what that means.

Stratus, best known for its fault-tolerant hardware that powers such critical systems as those at the Nasdaq stock exchange, recently unveiled a new line of machines designed to run Win 2000. The ftServer, which comes in two models, is designed to guarantee a maximum of 1 to 5 minutes of downtime per year.

Both boxes have been specially designed for Win 2000, including fine-tuned device drivers, and are priced to compete with the cost of setting up a traditional PC cluster. Clustering allows enterprises to link numerous PCs to ensure availability of applications.

Traditional Stratus computers, which run the company's proprietary Virtual Operating System and HP-UX, are designed to be fault tolerant with pairs of internal processors running in parallel. If one pair fails, the other keeps going.

Stratus officials say this is a benefit over clustering failover technology, which requires scripts and logic to recover from a failure. The Stratus hardware is designed to prevent failures, not recover from them, according to company officials.

"The level of complexity rises the bigger a cluster gets," says Vernon Turner, an analyst with IDC in Framingham, Mass. "With a single box, there is less management needed, fewer administrators and less overhead. We see more and more applications going to NT and Windows 2000, and Stratus fills a piece of the marketplace."

With the new line of ftServers, Stratus will use the same fault-tolerant concept as with its traditional hardware, except that failures can be detected on single processors. Processors are installed in pairs, and if one processor fails, the other continues operating.

Stratus also has a unique internal management system. If a processor fails, the computer contacts Stratus, allowing the company to remotely diagnose the problem and send replacement parts to the customer overnight.

"This is a reliable system, but the operating system will still be the single largest point of failure," says Richard Fichera, an analyst with Giga Information Group in Cambridge, Mass.

The Stratus ftServer has been tweaked specifically to handle Win 2000 device drivers.

To attack that issue, Stratus has confined device drivers to its own distinct boundaries for memory usage, so if they fail, they won't take down the entire operating system. The drivers are for such devices as PCI adapters and any communication or I/O in the software.

The ftServer will be available in two models, the 5200 and the 6500.

The 5200 comes in a one-way (two processors) and a two-way (four processors) 550-MHz Intel Pentium II Xeon processor that is priced at $23,300 and will ship in September.

The 6500 is a one-, two-, three- or four-way 700-MHz machine that will use Intel's forthcoming large cache Pentium III Xeon processor. It is priced at $30,500 and will ship in October.

Either model can be configured with up to 2M bytes of cache, 16 PCI slots and 48 RAID 1 disks. The models can be run in dual modular redundancy (two processors working in parallel) or triple modular redundancy (three processors).

Stratus: www.stratus.com

Chip technology speeds Web switches

BY APRIL JACOBS

MMC Networks is debuting a new architecture for its network processors that promises enterprise users faster, less-expensive switches for their e-commerce infrastructures.

MMC's nP content switching architecture lets the firm's network processors move Web switching traffic at wire speed, in this case Gigabit Ethernet, and migrate processor-intensive, network protocol-related software functions — such as network address translation and HTTP redirection — to the network processor. This speeds processing on the network processor and off-loads net-related processing tasks from general-purpose processors.

Network processors are more efficient than general-purpose processors because they have been optimized for network processing. Each MMC processor costs from $100 to $300. The MMC nP7120 network processor has two processing cores, each operating at 200 MHz.

MMC's network processors also use software-based instruction sets vs. older Application Specific Integrated Circuit (ASIC) technology, which makes them less expensive to develop. That's because chip upgrades can be programmed into new chipsets, unlike ASIC technology, which forces a new design with each new processor. MMC's network processors save users money because they are optimized to perform network-related tasks, such as network address translation, says Robin Melnick, director of marketing for MMC.

In January, the firm offered chips to go into Web switches that translate to a cost of about $50 per Fast Ethernet port.

Sean Lavey, an analyst with IDC in Framingham, Mass., says MMC has made strides in reducing the cost of Web switches by moving its technology closer to the network edge, to be used in switches and routers in e-commerce infrastructure.

MMC's network processors and switching engines can be used in Layer 2 to Layer 7 WAN and LAN switches and routers, as well as broadband, optical and wireless devices.

MMC: www.mmcnet.com

Directing traffic

Using network processors, customers can:

- Employ policy-based features on a Web switch to route requests based on the URL requested. This allows requests for static content to be sent to cache devices instead of Web servers, freeing the server to process requests for things such as purchases.
- Allow a request to be processed more quickly than if routed to a Web server, which must serve it up on the fly.
- Designate servers to be used for certain requests, such as those coming in from premium users.

Novell,

continued from page 21

in all the ways it can alter the schema," says Gerald Reynolds, IS director for the Central California Conference of Seventh-day Adventists in Clovis, Calif. "A stable, clean, well-maintained directory is more important to me than the ability to add bells and whistles to it."

Novell acquired ScheMax from its developer, directory management company Netoria, in 1999.

ScheMax lets customers without programming knowledge add attributes such as telephone number or PC inventory tag number to the directory.

Until now, Novell sold ScheMax for $4.50 per user. It is the first stand-alone tool Novell has given away. The company has met with a favorable response from users who have asked for free directory tools or free NDS for years.

"ScheMax was rather expensive before," says Porter, who wants to encourage Novell to provide more free software. "I would love to see Novell provide [NetWare utility] OnSite Administrator, which allows you to manage multiple servers remotely, for free. Now, in order to get [OnSite Administrator], you have to be a premium support customer. It's not even for sale."

Premium service support customers receive Novell's highest area of support on a 24-7 basis for a yearly fee. OnSite Administrator was in a public beta test for several years and used by a large number of people. When Novell withdrew it, it angered a lot of users, observers say.

"Any product that can help network managers make a more stable environment and reduce the calls to technical support people at Novell should be free," according to Porter.

ScheMax works with Novell's eDirectory and NDS Corporate Edition on NetWare 4 and 5, Solaris and Linux networks, and can be managed from Windows 95/98 or Windows NT workstations.

The software is available for download from www.novell.com/download#nds

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Storage hub on tap from SAN Valley

BY DENI CONNOR

CAMPBELL, CALIF. — The already crowded storage market got another player last week with SAN Valley Systems' introduction of a compact, low-cost managed hub that promises high availability.

Start-up SAN Valley's first product, the Aspen Managed Hub, is a 10-port SCSI-to-Fibre Channel hub that contains dual fans and power supplies. The box can be configured in a single Fibre Channel Arbitrated Loop configuration or in redundant dual loops. Starting at $4,500, the Aspen is less expensive than similarly configured hubs, analysts say.

"SAN Valley's Aspen hub is the first redundant and fault-tolerant managed hub in its price range," says Steve Duplessie, an analyst with Enterprise Storage Group in Milford, Mass. "You have to go considerably up the line to $200,000 director-caliber products before you get removable hot-pluggable power supplies and cooling fans. Ultimately, other storage-area network (SAN) vendors, such as Crossroads Systems and Brocade, will have to start offering products of this type."

SAN Valley was launched in August 1999 by four founders with experience at G2 Networks, an early SAN start-up, and Com21, a manufacturer of cable modems. The company will also manufacture a 24-port Fibre Channel switch as well as WAN and metropolitan-area network products for the growing SAN-over-IP market, which is generating interest among a lot of dot-com companies.

"The world lives on IP networks," Duplessie says. "You will see more and more [SAN over IP] in the future when network infrastructure players such as Nortel and Cisco jump into the market. SAN over IP is not going to replace Fibre Channel, but it's going to be a lot cheaper than running ATM. It's not perfect, but it's a heck of a lot better than shipping tapes Federal Express."

The Aspen is managed from a Windows NT Workstation-based application dubbed SAN Patrol. The software has SNMP support and serial support for out-of-band communications. It can monitor the status of the fans, power supplies and each port for fault detection and isolation.

The management software can also be used to configure the hub and send status updates to HP OpenView. Future plans call for integration with Computer Associates' Unicenter TNG and Tivoli's TME.

The Aspen Managed Hub will be available this month.

SAN Valley: www.sanvalley.com

PROFILE: SAN VALLEY SYSTEMS

Headquarters:	Campbell, Calif.
Product:	Aspen Managed Hub, 10-port fault-tolerant hub
Founded:	August 1999
Founders:	Sandy Helton, CEO and president; Peter Jordan, director of sales; Alison Parsons, director of software engineering; Loren Jones, director of hardware engineering.
Backgrounds:	G2 Networks, Com21, Data General, Network Peripherals.
Funding:	$15 million to $20 million from corporate and individual investors.
Fun Fact:	"Show and tell" for new employees every Friday at company lunches at which they tell their backgrounds and experience.

Here's to a faster Web site: the Compaq TaskSmart C-Series server.

Tolly on Technology . Kevin Tolly

EXAMINE THE STATE OF YOUR LAN

LANs were supposed to be easy by now. The near-universal convergence on unshielded twisted-pair (UTP) wiring of Ethernet LANs, TCP/IP stacks and Web browsers was supposed to end the turf wars and headaches of dealing with networks of mixed cabling, mixed topologies and mixed protocols.

The LAN infrastructure, we were told, would become like a data utility. You'd think about it as little as you think about the electric socket next to your desk. Well, maybe next year.

For now, the campus LAN rightfully remains a focal point of the infrastructure development effort. For every technology choice eliminated in the past few years, it seems like two more have sprung up in its place. With a three- to five-year time span needed to "remodel" the campus LAN, a wrong decision can remain an albatross for a long time. A technology choice made in haste can be your undoing, and the road not taken could rob your company of a significant competitive edge.

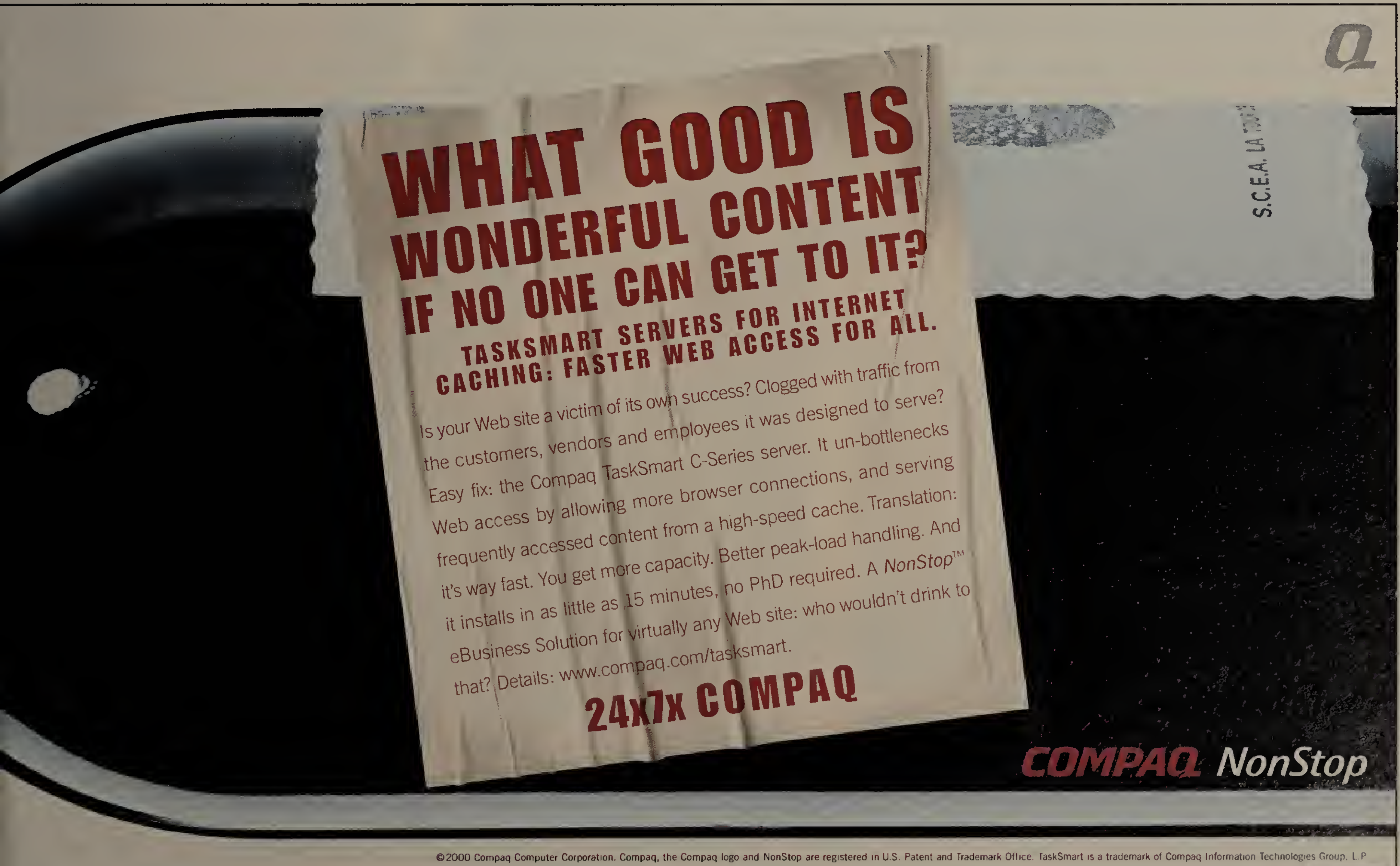
As we gear up for this spring's Tolly Group/Network World State of the LAN Town Meeting tour, I've been making my list of crucial technology issues. Examine the state of your LAN and see how your issues stack up against mine.

Better yet, join me, *Network World's* John Gallant and technically oriented executives from 3M, Alcatel, Extreme, Foundry, Lucent and Marconi as we make our way around the country during the next six weeks and let's talk about it in person. Check out www.nwfusion.com/townmeeting/lan/.

Here are a few things on my mind:

- **Packetized voice, the "un-PBX" and quality of service (QoS).** The telephony steamroller is slowly but surely heading your way. The upheaval of dealing with a radically different LAN application and the migration of black-box PBXs to distributed LAN systems will have a big impact on the campus LAN. With the arrival of voice, QoS will move from an academic topic to an essential element. The presence of big bandwidth can't simply erase all our QoS concerns.
- **Switches.** No longer are these essential pieces of infrastructure easily classified by noting the Open Systems Interconnection layer where they process traffic. With the emergence of load-balancing "Web switches" and vendors that claim to be able to process traffic at every layer from 4 to 7, we become almost paralyzed by the switch selection process. And what else should a switch do? Should it also be a Web cache, a content filter, a firewall and a virtual private network server? They're all out there.
- **Wondering about wiring.** The toughest decision of all is with regard to wiring. Sure, Category 5 UTP is safe, but is it right? Gigabit-over-copper products are rolling out at an increasing pace. And new systems built around Cat 5e and 6 UTP have shown they can do the job. But copper will never be able to match fiber when it comes to extended distances — and how far is far enough? There are claims that new fiber technology makes fiber to the desktop the best way to go.

Tolly is president of The Tolly Group, a strategic consulting and independent testing company in Manasquan, N.J. He can be reached at ktolly@tolly.com or www.tolly.com.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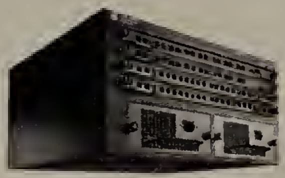

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Network reliability is based on internal network reports for Q1 & Q2 of 1999.

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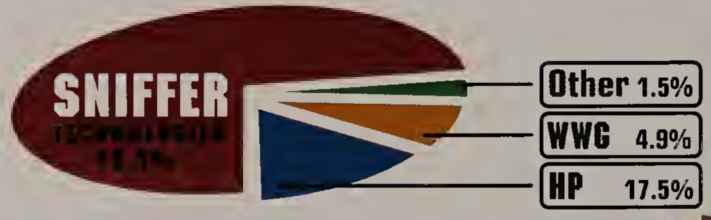

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Source: IDC

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APPLICATION REAL-TIME MONITORING	●	◒	◒	○
SCALABLE DISTRIBUTED REPORTING	●	◒	◒	◒
SWITCHED & CONVERGED NETWORKING	●	◒	○	◒
PLANNING "WHAT IF" ANALYSIS	●	○	○	○
RMON2 STANDARDS COMPLIANCE	●	●	●	○

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Carriers & ISPs

The Internet, Extranets, Interexchange and Local Carriers, Wireless, Regulatory Affairs

Briefs

The **Federal Communications Commission** says it is concerned enough about the way some local carriers are deploying digital subscriber line (DSL) that it will hold a public forum on the subject May 10 to examine the key technical issues. Local carriers are deploying DSL via line cards in neighborhood remote terminals connected via fiber back to the central office.

Announcing the forum, the FCC said it "commends" efforts by big carriers to deploy fiber closer to end users but added that remote terminals often leave "little or no space available for collocation" by competitors.

The FCC says it also wants to explore "lifeline heat and power limitations" in remote terminals and "the complexity of developing back-office systems to manage these proposed network configurations," especially since several competitors' traffic could be mixed together on the fiber backhaul.

Competitive local exchange carriers in particular have complained about these and other potential hurdles in **SBC Communications' Project Pronto** DSL rollout, which is based on up to 20,000 remote terminals.

Lucent and **Qualcomm** have demonstrated wireless technology that will boost wireless data speeds tenfold.

The technology, a variant of Code Division Multiple Access, supports 153K bit/sec wireless data speeds and is scheduled to be tested this summer by Bell Atlantic's wireless division, the newly named Verizon Wireless.

If those tests prove successful, customers could be using smart phones with faster Internet access by next year. Current wireless data speeds range up to 14.4K bit/sec.

Unidial gets a new name and focus

BY TIM GREENE

LOUISVILLE, KY. — The people at Unidial want you to remember the name Lightyear Communications.

That's because Unidial has changed its name to Lightyear to reflect that it will now sell voice and data services on its own network, as opposed to only reselling phone service on the networks of other carriers.

Along with the new name, the company is using a network architecture that extends ATM to customer sites. That way it can provide voice, data and Internet services over a single line at rates that undercut the traditional alternatives.

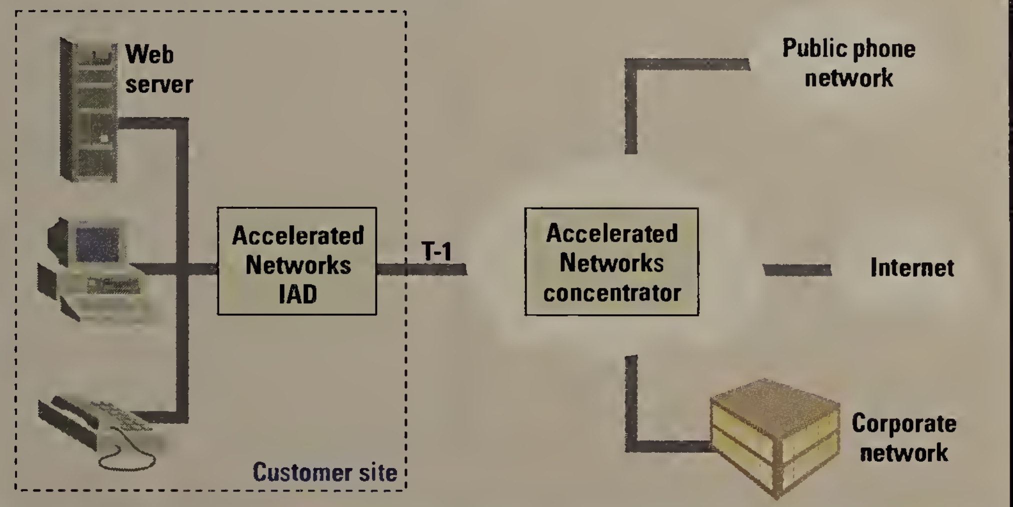
Rather than buy separate phone and data lines as well as an Internet-access connection, customers can buy just one link from Lightyear. An office connected to those services by three T-1s would pay $6,000 per month. With Lightyear, the bill would be $3,650, the company says.

Customers pay no upfront costs for installation of the service. Phone service includes long-distance, which ranges from 3 to 7 cents per minute, depending on the service package the customer buys.

That sounds like a good deal, according to Jon Etherton, network coordinator for *The Spokesman-Review* newspaper in Spokane, Wash., who sets up communications for the paper's branch offices. Although Etherton doesn't use the service, when he heard it described, he said it is reminiscent of channelized T-1 services that carry voice and data. The difference is that with the Lightyear service, bandwidth not being used by phone calls is freed up for data.

Lightyear puts all services on one pipe

Lightyear Communications installs an integrated access device (IAD) at customer sites and runs voice, data and Internet access services over a single T-1 link, saving customers the cost of multiple lines.



Etherton also noted that in a corporate network, it might be less expensive to run all Internet traffic through a single, centrally located link rather than giving each branch office its own.

To provision its service, Lightyear installs an Accelerated Networks AN-30 integrated access device (IAD) at each

See **Unidial**, page 36

Qwest and fixed wireless carrier react to FCC rules

BY DAVID ROHDE

BELLEVUE, WASH. — One of the country's emerging fixed-wireless local-loop carriers is speeding up changes it plans for the way it reaches users because its key investor is buying a Bell carrier.

Advanced Radio Telecom (ART) is accelerating its plan to exit the business of selling fixed-wireless connections directly to business users. Instead, it will offer its 38-GHz broadband connections to ISPs and other service providers that could turn around and provide them to enterprises.

The reason for the urgency: 19% of ART's stock is held by Qwest, which is in the process of buying US West, a carrier that is currently barred from carrying long-distance traffic. The purchase would technically make ART an affiliate of US West, meaning it would fall under the same long-distance restrictions.

In a document submitted to the Federal Communications Commission, Qwest revealed that ART intends to terminate service to 300 subscribers in the US West region — the part of the country where most of ART's networks are located. The subscribers receive Internet access service over ART's fixed-wireless connections.

Robert McCambridge, chief operating officer of ART, says the company had already been planning to go to a wholesale model in which ISPs, application service providers and others supplemented the fiber and copper loops at their disposal with fixed-wireless links to buildings.

The intent to move to wholesale was part of a June 1999 restructuring in which

See **Qwest**, page 36

Branching out from the West

Three of Advanced Radio Telecom's four broadband wireless networks are in US West territory, but ART is building in eight additional cities this year outside of that territory:

Already built:

In US West territory: Phoenix; Portland, Ore.; Seattle

Outside US West territory: San Jose

To be built this year:

Boston; Dallas; Houston; Los Angeles; New York City; Orange County, Calif.; San Diego; Washington, D.C.

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DSL makes it easy for your employees to work from home. One high-tech company in the Pacific Northwest has over 1,500 telecommuters using DSL to access corporate resources through a Virtual Private Network. DSL uses existing phone lines and allows users to phone or fax while connected so no additional wiring or telephone lines are required. Another company uses DSL to connect employees and gives access to corporate resources, including uninterrupted audio and video streaming of key communications and training presentations.

DSL can streamline your inventory process. A convenience store chain has seen the proof in this. Hand held computers are used to track inventory in the stores. That information is transmitted to the corporate server to have inventory ordered and delivered to the store, keeping shelves filled, and the need to store inventory down. The speed and reliability of the DSL connection saves both time and resources for the company daily.

DSL is the reliable backup for existing networks. If your company already has a broadband network in place, DSL can be used as an alternate connection to the network in the event of downtime. DSL provides a much faster connection than dial-up without the loss of bandwidth.

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Qwest,
continued from page 33

investors refinanced ART, McCambridge says. The company is building a system of metropolitan-area links based on broadband wireless local-loop connections connecting to Cisco gigabit routers for high-speed Internet access and other services.

As opposed to some other fixed-wireless providers, which provide only ISDN or slightly higher links, ART now will provide DS-3 or OC-3 links to the carriers.

Technically, the carriers could then multiplex down their connections to individual companies in, for example, an office building — to make them all fixed-wireless local-access users to a WAN.

But for ART's existing users, the migration is not likely to work out quite like that. Instead, McCambridge says, they are likely to migrate to digital subscriber line (DSL) providers. ◪

Unidial,
continued from page 33

customer site. The gear has ports for phones and data, and turns all traffic into ATM cells. The IAD drops the data onto the appropriate ATM virtual circuits on a T-1 line running between a customer site and Lightyear's network.

There, traffic from multiple customer sites is concentrated on Accelerated's AN 3220 concentrators and backhauled to Lucent CBX 500 ATM switches.

The switches sort out voice traffic and shunt it to local or long-distance networks as appropriate. The data is sent to the appropriate ISP or to another customer site. "We are only now able to do this. The availability and reliability of the equipment we needed has come about in the past year," says G. Henry Hunt, Lightyear's senior vice president.

The architecture is similar to that employed by 2nd Century, another competitive local exchange carrier that sees combining services onto a single access line as the way to save customers money.

If Lightyear wanted to offer such services a year ago, it would have had to buy its own local voice switches, a prohibitively expensive option. "At $8 million per [point of presence], we could not afford it," Hunt says.

In the future, Lightyear wants to use digital subscriber line (DSL) links to customer sites because they cost less than T-1s. At the moment, DSL is available to only about 20% of the customers Lightyear would want to reach, says Mike Johnson, the company's chief technical officer.

The company also expects to cut costs further by using expected features in Accelerated gear that will eliminate the need to buy services from other carriers that provide calling features such as caller ID or call forwarding.

Lightyear will introduce the services July 1 in Anaheim, Calif.; Atlanta; Boston; Chicago; Cleveland; Indianapolis and Louisville, Ky. They will be available in seven more cities by year-end, Hunt says. Lightyear says it will continue to resell local phone services from other carriers as it installs the new network.

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Eye on the carriers . David Rohde

QWEST'S BEHIND-THE-SCENES MERGER MANEUVER

Ever since Qwest Communications won a bidding war against Global Crossing last July to buy US West, Qwest officials have boasted that this is a different kind of telecom merger.

They've claimed their deal presents none of the anticompetitive potential of SBC Communications buying Ameritech or MCI WorldCom buying Sprint, happily spinning out reports of state governments and shareholders falling in line with quick approvals.

Now documents have come to light showing that behind the scenes, the Qwest/US West merger has been a messy business in which Qwest officials have been deeply worried about the impact on their customer base. The documents also show why the merger isn't ready to close and even runs an outside risk of falling apart despite the Federal Communications Commission's "conditional approval" granted in March.

Of all the recent mergers, Qwest/US West is the first that combines an almost pure long-distance carrier with a pure local Bell — US West still hasn't filed a federal long-distance application for any of its 14 states. And the FCC absolutely, positively forbids unauthorized Bells from carrying long-distance traffic within their regions — no matter how many times they buy or sell another carrier, take on partners, change their names, make their beds, take out the garbage or eat their broccoli.

Publicly, Qwest officials say they know all that. But privately, someone there has been seeking a way to avoid cutting a hole the size of US West in their network and forcing enterprise network managers to deal with two different carriers.

On Feb. 9, Qwest officials met with McLeodUSA, a regional carrier thinking of participating in a Qwest divestiture. Sworn affidavits from McLeod employees charge that at the meeting, officials "disclosed Qwest's desire to sell the [western long-distance] assets to a friendly buyer, so the assets could be reacquired in the future."

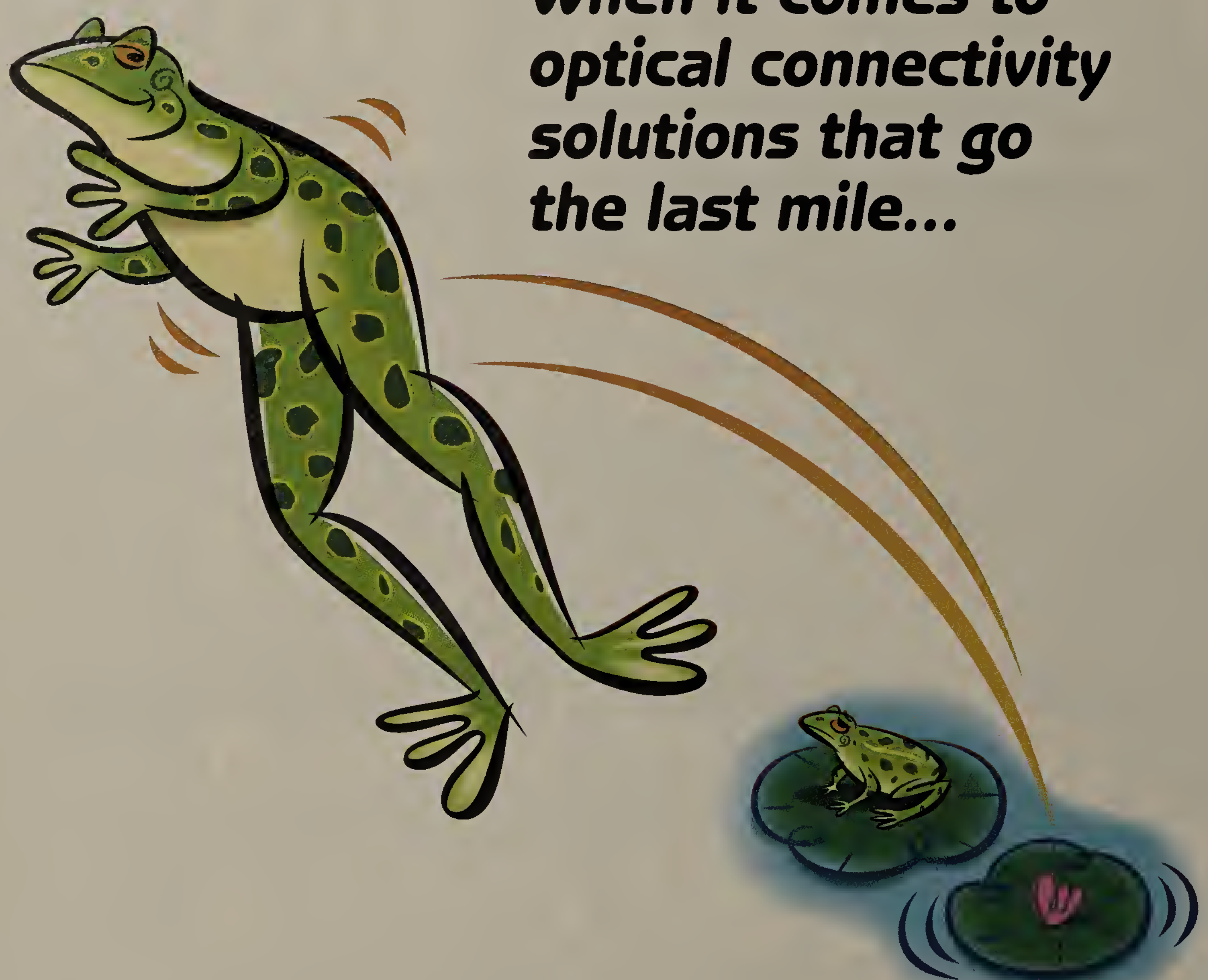
On Feb. 11, McLeod officials marched into the FCC to relate this story, just as Netscape rat-finked on Microsoft to the Department of Justice. FCC officials demanded that Qwest tell them what the heck was going on.

On Feb. 17, a Qwest lawyer wrote back saying the senior Qwest official at the Feb. 9 meeting was only "speculating," attaching an affidavit from that official's boss saying the "friendly buyer" remarks were "uninformed and unauthorized."

Since then, Qwest has decided to sell the western long-distance business to another carrier with no right of reacquisition, but the FCC still has to rule on the details of that sale. In what some analysts are taking as a fit of pique by the FCC, the agency has demanded to know what Qwest will do with its Internet addresses and Web-hosting centers in the US West region, as well as its long-distance traffic.

Qwest says it won't give those up, and it has a point. No Bell has been told it can't even originate Internet traffic, as opposed to carrying it across local boundaries. But if the FCC presses the issue, this merger could yet founder.

Rohde is a Network World *senior editor. He can be reached at drohde@nww.com.*



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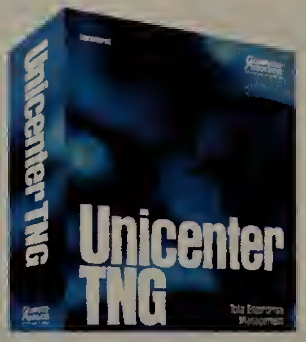

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Enterprise Applications

Intranets, Messaging/Groupware, E-commerce, Security, Network Management, Directories

Briefs

Andersen Consulting last week formed a partnership with **Sun** to establish an Internet-based procurement firm the companies hope will facilitate over $200 billion worth of indirect procurement by 2004.

The yet-to-be-named e-procurement venture will feature products from Sun and iPlanet E-Commerce Solutions, a part of the Sun-Netscape Alliance. Specifically, Andersen Consulting will oversee day-to-day operations, iPlanet the software packages, and Sun the servers and storage. The e-procurement firm is expected to be up and running by the end of the third quarter.

Andersen Consulting: www.ac.com; Sun: www.sun.com

Microsoft last week released a second beta version of SQL Server 2000, which features support for XML and new clustering and scaling features. The database also includes an integrated data-mining engine and is a key piece of Microsoft's Windows 2000 DNA platform for electronic commerce.

A new Distributed Views feature lets users distribute processing across multiple SQL servers. The server also supports four-node failover clustering and is integrated with Active Directory.

The beta version can be ordered at www.microsoft.com/sql/.

Entrust Technologies last week said it will acquire the Santa Clara firm enCommerce, which makes software for business portal access control and management. Entrust, which specializes in security technology, is acquiring enCommerce in a stock swap valued at about $470 million. The companies plan to complete the deal by the third quarter.

Nuclio makes net managing easier

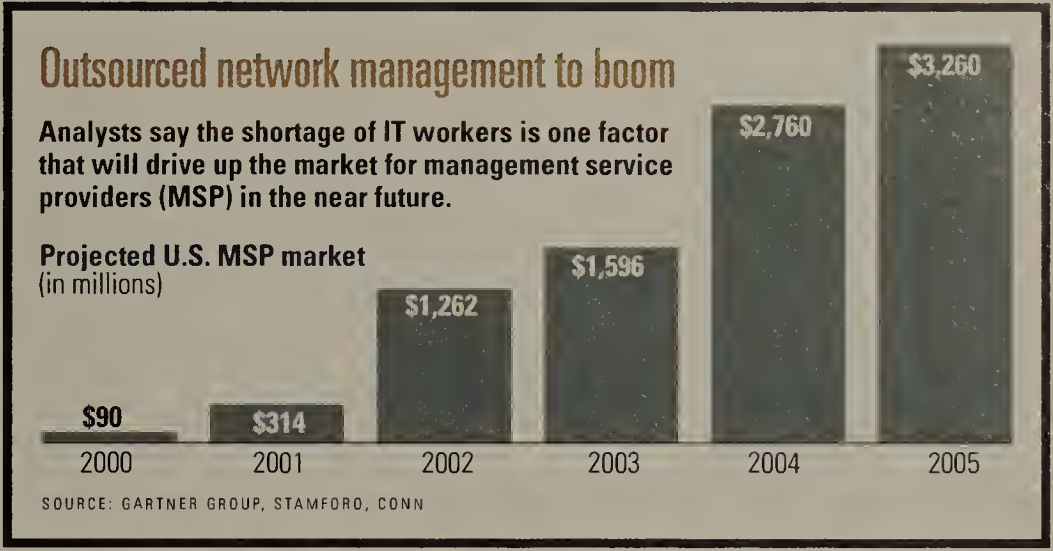
BY PHIL HOCHMUTH

When it comes to managing other people's networks, the three keys to success are automation, automation and automation, says John Jazwiec, CEO of Nuclio Corp., a management service provider (MSP) that debuted last week.

Nuclio is the latest company to enter the nascent MSP market. The company provides automated 24-7 network equipment and application monitoring, service provider service-level agreement (SLA) monitoring, desktop management and help desk services.

According to Gartner Group, a research firm in Stamford, Conn., the MSP market is set to explode, from $90 million this year to $3.26 billion in 2005. Analysts say the shortage of IT professionals in the U.S., combined with rapid infrastructure expansion from technology-dependent start-ups and large companies, will drive more organizations to outsource network management.

"A lot of dot-com companies don't have an IT department," Jazwiec says. "Some large companies are just looking for some extra help."



Outsourced network management to boom

Analysts say the shortage of IT workers is one factor that will drive up the market for management service providers (MSP) in the near future.

SOURCE: GARTNER GROUP, STAMFORD, CONN

Nuclio customer networks are monitored from the company's Chicago data center via Nuclio's frame relay network or secure point-to-point connections.

In Chicago, a customized system based on Hewlett-Packard's OpenView management platform alerts Nuclio engineers of events or failures on customers' networks — such as server crashes or if network performance dips below a customer's SLA requirements. Customers can view their network information via a customizable Web portal that is accessible through Nuclio's Web site.

"Our management services provide reliability and predictability because they are almost totally automated," Jazwiec says. With its automated management tools, Nuclio provides more consistent information "than having a human being sitting in front of a terminal watching servers or your network," he adds.

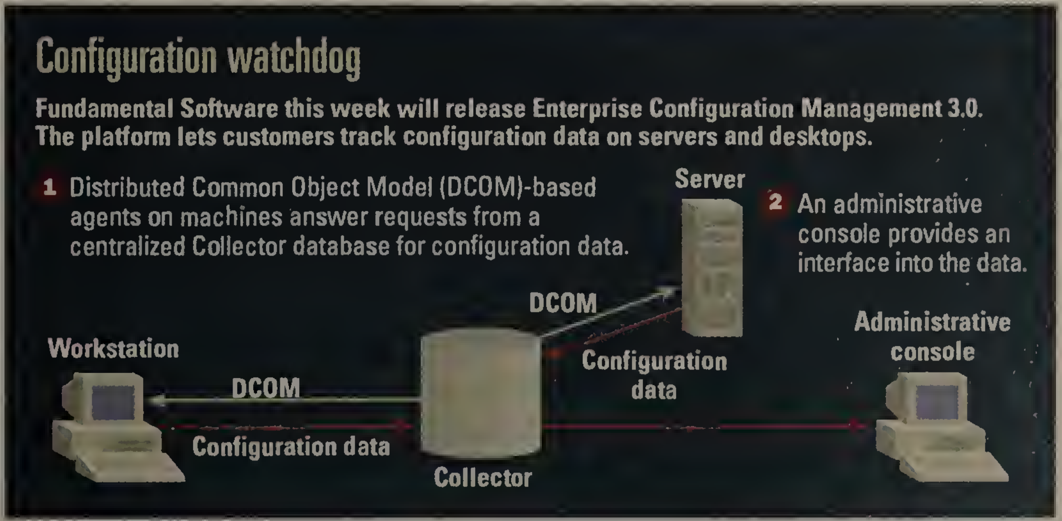
According to Scott Crites, information resources manager at Mail-Well, a label and envelope printing firm in Omaha, Neb., Nuclio's services provide his company peace of mind and cost savings.

See **Nuclio**, page 46

Fundamental keeps watch on configuration settings

BY JOHN FONTANA

Developing and managing configurations on servers and desktops can be a time-intensive task, but it's one Fundamental Software is attempting to automate.



Configuration watchdog

Fundamental Software this week will release Enterprise Configuration Management 3.0. The platform lets customers track configuration data on servers and desktops.

1 Distributed Common Object Model (DCOM)-based agents on machines answer requests from a centralized Collector database for configuration data.
2 An administrative console provides an interface into the data.
Server
DCOM
Workstation
DCOM
Configuration data
Collector
Configuration data
Administrative console

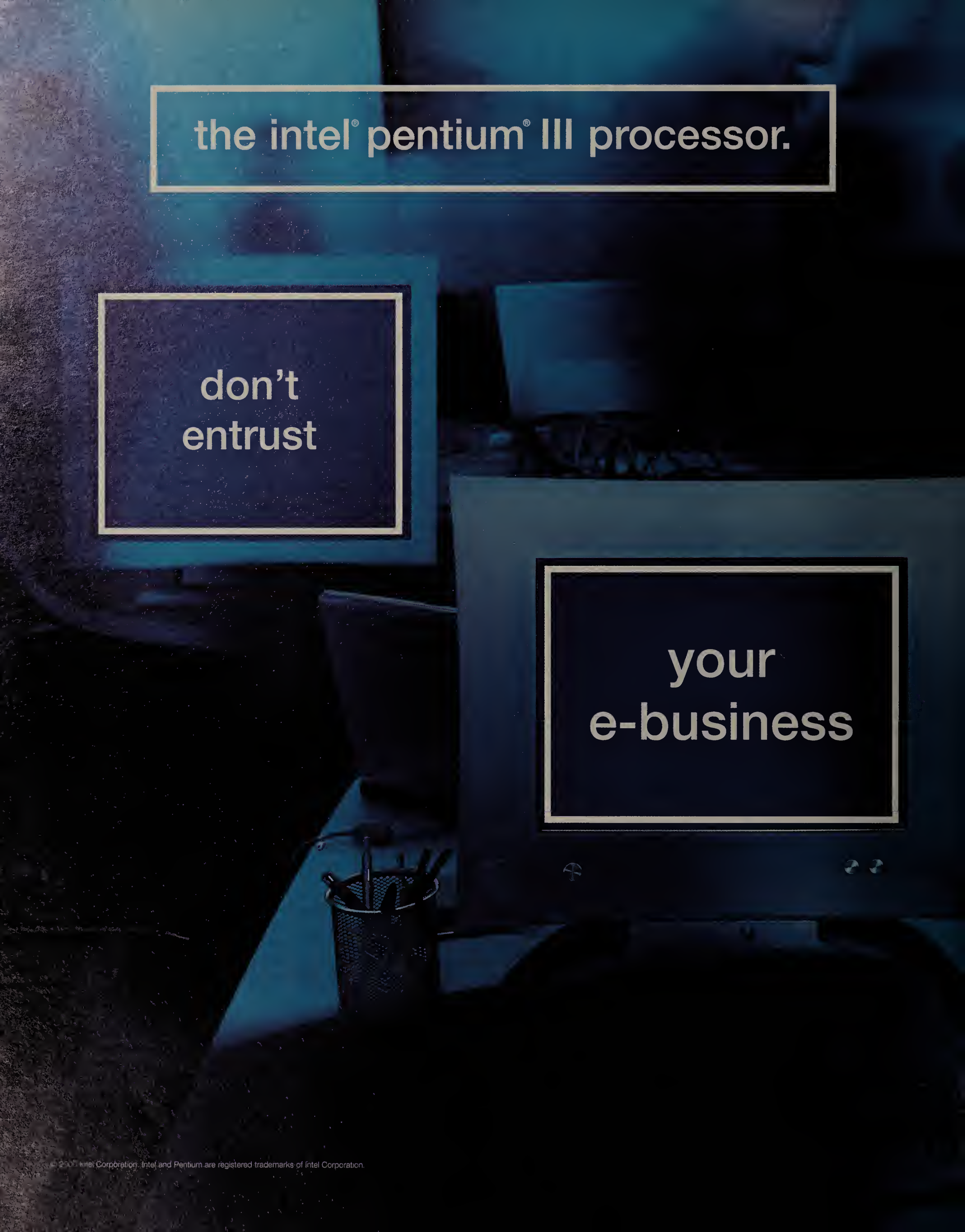
The company this week will release Version 3.0 of its Enterprise Configuration Management (ECM) platform, which is focused on Windows 2000 and NT. The software is built around a centralized Collector, which runs on Microsoft's SQL Server, and a series of agents deployed on any number of networked servers and desktops.

The agents are actually Distributed Common Object Model components that can be installed on machines automatically and lay inactive until they are called by the Collector to supply configuration data.

For IT managers faced with a growing number of networked computers, ECM provides a way to root out inconsistencies in configurations that can cause network errors or security breaches. The software also can monitor compliance to configuration standards and test readiness for rollouts of Win 2000 servers. It also lets users automatically change local administrative passwords or service logons on any server from a central console.

"IT is interested in having more tasks like this automated because of the increase in complexity of their networks and limits in staffing," says Rich Ptak, an

See **Fundamental**, page 46



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Lessons from an Asian B2B exchange

BY ELLEN MESSMER

SINGAPORE — While dozens of brand-new business-to-business exchanges are eager to grab the spotlight, an older service provider used by high-tech manufacturers active in Asia offers a telling lesson on the advantages and drawbacks of online supply chains.

ECnet's services have been adopted during the past two years by hundreds of U.S. and Asian manufacturers in the Far East. Firms such as Matsushita, Motorola and Mattel use ECnet services to share business information electronically.

While the advantages — such as faster order processing vs. fax or phone — are clear, there's also a burden: the need for trading partners to conduct some necessary systems integration to get the most out of the supply-chain services.

Active in the U.S. since last fall, ECnet is an Internet exchange that can convert documents into electronic data interchange, HTML, XML or proprietary formats such as SAP's iDoc and transmit them directly into an intended recipient's back-end system, Web server or mailbox.

ECnet sprang up because traditional EDI value-added networks aren't as widespread in Asia as they are in North America, and manufacturers that were big EDI users found their smaller suppliers were having trouble with the technology.

ECnet's document translation and processing costs are not particularly high — a few hundred dollars per month might be typical based on cost-per-kilobyte charges. And ECnet demands no percentage of sales of the manufacturing parts ordered using its service, unlike many of the emerging online business-to-business exchanges.

The company offers three services, including ECBuy for exchanging purchase orders, shipping notices, delivery confirmations, exception handling and shortage notices. The supplier can instruct ECnet to issue e-mail or paging alerts directly to a procurement manager when an online deal hits a snag.

The second service, ECplan, lets buyers post their forecasts so suppliers can commit to produce parts based on their manufacturing capabilities.

According to James Thatcher, ECnet's vice president of strategic alliances, the online business-to-business exchange recently launched a third service called vendor-managed inventory (VMI). VMI usually involves the supplier setting aside inventory in its warehouse for an important buyer but not charging for it until the supplier gets an electronic order with a requested shipping date. VMI supports the buyer's just-in-time manufacturing plans, and suppliers will support VMI to keep good relations with important customers. VMI usually requires a buyer to have a remote view into the supplier's inventory management system.

"All the high-tech manufacturers are either implementing VMI or have plans to do it this year," Thatcher says. "The manufacturers can't afford to just sit there with inventory in their warehouses."

The downside

The drawback to this business-to-business interaction is that even the simplest of the ECnet services — ECBuy — requires custom systems integration to ensure document translation goes smoothly.

"We sit down with the buyer and supplier to find out what data format is easiest to export," Thatcher says. The process generally takes several weeks and costs a few thousand dollars.

Even though ECnet's services are not what users call plug-and-play, customers say the online document exchange offers advantages over fax, phone and e-mail. Information can be sent via the Internet all around the world directly into enterprise resource planning (ERP) systems.

"We used to be mailing hard copies or faxing," says Al Sardella, director of global procurement at NatSteel Electronics in Singapore. "When manufacturing schedules are altered and there's a lot of back and forth, it's better to have an automated, rather than a manual, process."

Another ECnet user, National Semiconductor, takes in orders sent by FTP to a designated Web site. The firm's mainframe-based ERP system in Santa Clara will poll the site regularly to pull order data inside the corporate intranet.

"Until June of last year, the only way we would deal electronically with another company was with EDI," says Mike Glynn, director of IS for the sales and marketing division at National Semiconductor. "But EDI is expensive in Asia, and our customers there weren't big into EDI, so we'd have to print the orders out and enter them into our system."

So far, users are relying on ECnet primarily to buy or sell their high-tech wares. And for those mainly selling, getting their customers online is proving to be a challenge.

"We're a seller hub," says Glynn, pointing out that sellers typically have less power than buyers to get their trading partners to accommodate their e-commerce processing wishes. Buyer hubs, such as Siemens Singapore, for example, appear to be having an easier time getting trading partners to join the ECnet exchange, he adds. ◪

PROFILE: ECNET

Based:	ECnet
Founded:	1995 (formerly known as Advanced Manufacturing Online).
Based:	Singapore, with access points in Malaysia, Thailand, Hong Kong, Taiwan, Korea, Japan and the U.S.
Services:	ECbuy for automated order-processing between buyer and seller; ECplan, for sharing forecasting information with suppliers, which in turn can respond with performance commitments.
Customers:	48 manufacturers and 800 suppliers, primarily in electronics.
Employees:	230
Funding:	Privately held, with investments from Asia Technology, 3I Group, Doll Capital, Goldman Sachs and Morgan Stanley.
Web site:	www.ecnet.com

Fundamental,

continued from page 43

analyst with the Hurwitz Group in Framingham, Mass. "The ability of this technology to deliver data in real time is important."

ECM 3.0 features Win 2000 Migration Reports, BackOffice compliance reports and support for Windows Management Instrumentation, which collects management data from hardware and software.

The migration reports are designed to evaluate NT hardware as business users move to Win 2000. With more than 30 reports, users can collect configuration data on such devices as network interface cards, memory and disk space. Fundamental also has included the Win 2000 hardware compatibility list within the Collector so hardware compliance can be checked automatically. In addition, infrastructure reports can be run to check configurations for Dynamic Host Configuration Protocol, Domain Name System, Windows Internet Naming Service and TCP/IP settings.

The software also comes with a set of prebuilt compliance reports for assessing configuration compliance on SQL, Exchange and Internet Information Servers, including registry settings, service accounts and service packs. ECM features multiple compliance reports for each server.

ECM 3.0 is priced at $500 per server and $50 per desktop.

Fundamental: www.fundamentalsoftware.com

Nuclio,

continued from page 43

Crites says when his company installed a WAN to connect the firm's Omaha office to Mail-Well's six printing plants across the country, the system required more management personnel than his department could handle.

"I ran an advertisement looking for network administrators and got only three responses — none of them qualified," Crites says. "We're probably saving about $50,000 a year by using Nuclio. If I would have hired three people to do [HP Unix, Windows NT and WAN] administration, it would cost me a lot more. I got better people for less dollars."

Nuclio monitors NT servers at Mail-Well's headquarters and HP Unix servers at its six remote facilities. The company also monitors MailWell's nine Cisco and Bay routers, and provides desktop application management and a user help desk service for the company's 175 PC users.

"If problems occur anywhere in the network, that sets off an alarm automatically that [Nuclio engineers] can react to and fix. It's Nuclio's responsibility to keep our tools available to us," Crites says.

Stephen Elliot, a Gartner Group analyst, sees big things for the MSP market.

"In the next 18 to 24 months, more and more companies will start using these MSP services," Elliot says, adding that what companies like Nuclio offer "is cost-effective in terms of IT staffing allocation, and it provides a predictable expense line every month."

Prices for Nuclio's services are set at a fixed monthly rate per device or application monitored. Average monthly rates for a midsize corporate network would run between $5,000 to $25,000 per month, according to Nuclio's Jazwiec, depending on the level of service.

Nuclio operates as a wholly owned subsidiary of systems integrator Forsyth Technology, which was providing customers with managed IT services prior to the spin off of Nuclio. Nuclio already has 25 customers, including the Chicago Stock Exchange. ◪

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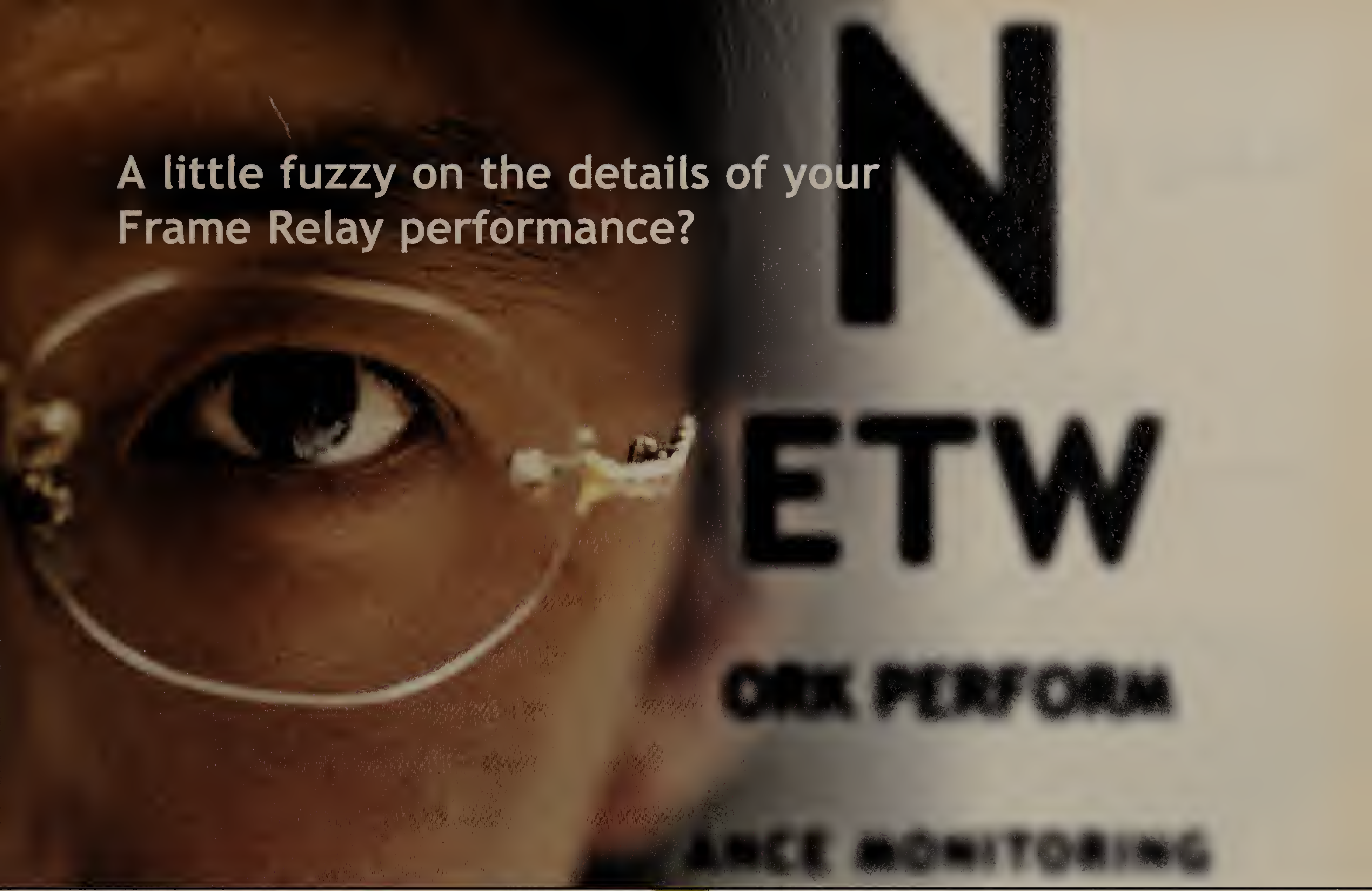

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InfoImage servers bring corporate data to light

BY JASON MESERVE

PHOENIX — InfoImage is bringing Microsoft's dream of a unified, browser-based view of corporate data to life with the release of freedom 2 B2B and B2E Decision Servers.

The two products tie into Web servers and Microsoft's Office 2000 line to provide users an aggregated view of company data in a browser window or, as dubbed by Microsoft, a Digital Dashboard.

The freedom 2 B2E server supports internal users by providing them with their own personalized views into corporate data. The B2B edition extends that information access to external customers and suppliers, providing a self-service center for viewing related information. The freedom line features technology that lets users link multiple InfoImage servers, which will help provide greater scalability.

InfoImage has also developed what it calls Peripheral Vision, a means of using business logic to connect various types of related but separate data. For instance, a salesperson looking at an order could click on individual products to get a description or click on the company name and get a complete order history of that client, says Randy Eckel, InfoImage's CEO.

Freedom also comes with Collaboration Manager, a module for linking with Lotus Notes or Microsoft Exchange messaging systems. Eckel says this module allows information gathered with the freedom product to be passed along to others more easily.

"The module can help identify the people that are stake holders or experts in a piece of information, so users can go beyond the seven people they normally talk with to get additional feedback," Eckel says.

Best Foods North America is in the process of introducing the freedom B2E product to 300 members of its sales force to provide them with better access to the company's SAP system.

"SAP does not do a good job of aggregating reports," says Kevin Kyle, director of customer strategies at the Englewood Cliffs, N.J., food distributor. "We're looking to use the freedom tool as a complement to our SAP implementation that will let sales managers view recent customer orders and see what has shipped."

Kyle selected the InfoImage product based on response from friends at Gillette who were using the product successfully with their own SAP system. "Not a lot of vendors in this market have actually gone out and delivered product," Kyle says of the competition. "I was impressed with the Gillette system and the direction of InfoImage."

Pricing for freedom 2 B2E Decision Server starts at $200 per user, and B2B starts at $30 per user. Although this is the second release of the InfoImage server line, it is the first time the company has had such deep integration with the Microsoft platform. The two companies announced the Digital Dashboard idea in October 1999.

InfoImage: www.infoimage.com
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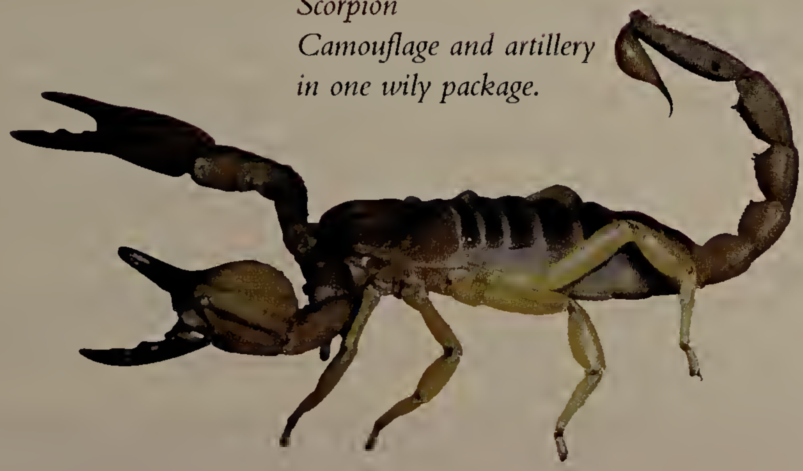
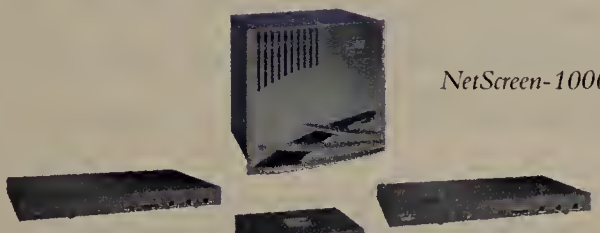




'Net Insider . Scott Bradner

ATM: A FUTURE THAT NEVER WAS

Many people seem to consider me an ATM opponent, but I consider myself an ATM realist. Wearing whichever hat you place on me, I'd like to engage in a bit of an ATM postmortem.

Once upon a time, the future was to be all ATM, all the time. For years I saw projections of $X billion worth of ATM sales N years in the future. X and N varied depending on the consulting firm that was putting out the projection, but the values of X and N seemed to stay consistent year after year from any individual consulting firm. In absolute terms, ATM has grown into a reasonable-sized business, but it remains a very small part of the overall network market.

It is a bit of a cheap shot to talk about the fate of desktop ATM, so I'll let dead dogs lie and move on to two places where ATM was expected to take over the market: backbone and access networks.

With all the speed they can muster, telephone companies have been rolling out ATM-based services at a glacial pace. In many parts of the U.S., you can get ATM virtual circuit-based connections. Some offerings even have distance-insensitive pricing, making them very attractive. Many companies are signing up for these services, but this will be a short-lived phenomenon.

I expect that IP services, including IP-based virtual private networks, will take over this market. In addition, I don't see much future for ATM in supporting IP backbone services. ATM is good at splitting up links into smaller pipes, but this does not seem to be all that useful when ISPs are growing to the point where they need full OC-48 and OC-192 links between point-of-presence locations.

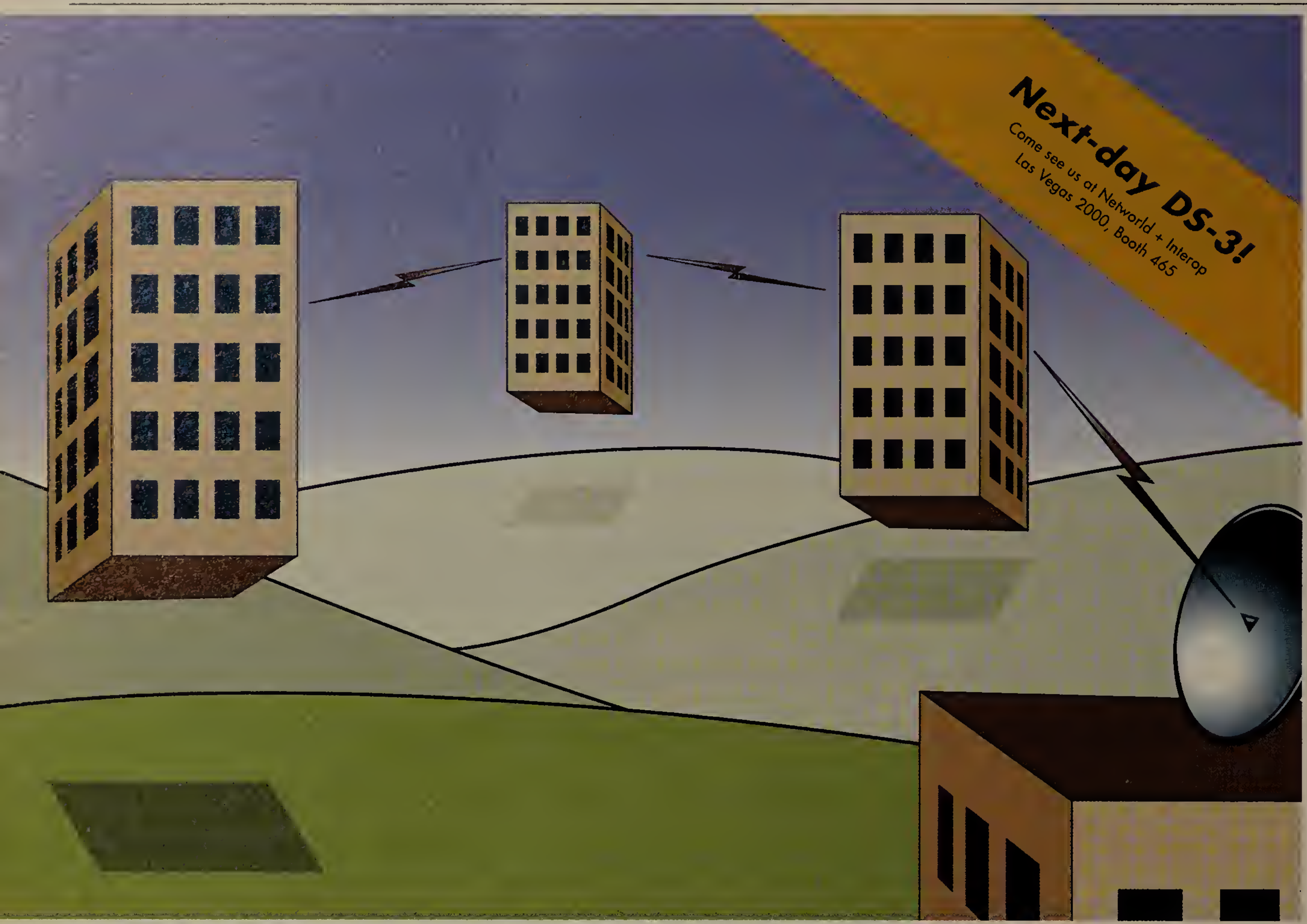
I expect that Multi-protocol Label Switching will be used instead of ATM where links still need to be subdivided. That leaves access networks. This may come as a surprise to some of my regular readers, but I think ATM features are a good match for the requirements of access networks. Links to individual locations tend to be small, and if there is a desire to multiplex multiple services over those links, ATM seems to be a better technology than IP.

For example, I expect to see a lot of ATM-supported integrated access devices being deployed as part of telco-based digital subscriber line services. This is partly because much of the telco world hungers for any way to maintain the circuit-based philosophy of the telco networks. ATM will not give the telco world much satisfaction in this case, however, because the ATM virtual circuit will only span the access link and not be end to end.

Proponents of ATM irrationally assumed that a single technology would meet all network requirements, and a lot of money was lost in that assumption. I wonder if some IP proponents are guilty of the same hubris.

Disclaimer: Harvard and hubris in the same article? No way. So the above must be my own opinion.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.



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Supply-chain software meets Web-based e-commerce

E-COMMERCE APPLICATIONS

Supply-chain management retailers, distributors and manufacturers aim to share logistics data via the 'Net.

BY ELLEN MESSMER

For decades, corporations have been using supply-chain management (SCM) software to plan product purchases or sales, and keep track of ordered items through the shipment and billing processes.

But now the advent of Web-based e-commerce is leading to a transformation in SCM. That's because retailers, distributors and manufacturers want to share logistics information by giving trading partners and even consumers direct Web access to their SCM systems. In addition, some industries, such as grocery and apparel retailing, are starting to use shared Web-based online supply chains as hosted business-to-business exchanges. And newcomers, such as Nistevo, offer specialized hosted services to outsource specific touch points in the chain, such as freight management.

It's all bringing a revolution to the SCM software industry, forcing older, established vendors such as Manhattan Associates to rethink their strategies. Manhattan's PkMS software, available for Unix, Windows NT and OS/400, is used by 450 corporations in retailing, apparel, grocery, manufacturing and other industries for inventory management and order pickup. Customers include Staples, Polo, Nordstrom, Jockey and Mikasa.

According to Manhattan account representative Joel Daffiere, PkMS is used to collect logistics information that gets stored in back-end ERP systems such as those from SAP, Oracle and JD Edwards. PkMS users generally access this business data over private lines.

"Today, they don't allow outside suppliers into their systems," Daffiere says about corporations using PkMS. But he acknowledges his customers are demanding Web access for their employees and trading partners.

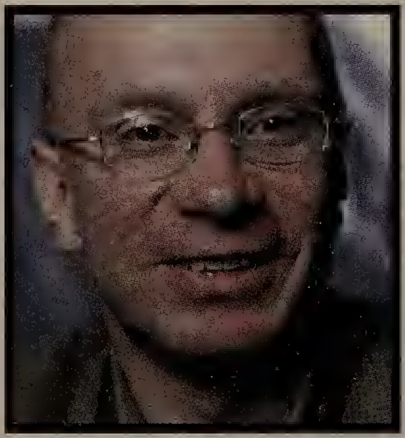
So Manhattan Associates has embarked on what it calls the Wildwood Project to ship Web-based software later this year that will provide a more open environment.

"There is some risk when trading partners gain access," Daffiere says. "How much do you want them to see?"

Another SCM old-timer, TranScape, got Internet religion last year and made its transportation logistics software Web-friendly.

Analysts generally categorize SCM software into two types: "supply-chain execution," including order management, transportation scheduling, and warehouse packing and shipping; and "supply-chain planning" for forecasting demand, inventory replenishment and manufacturing/production scheduling.

According to Boston firm AMR Research, Manhattan falls into the first category, a segment it shares with EXE Technologies, Industri-Matematik International, International Business Systems and other companies, including start-up Yantra, which is gaining attention with its Web-based PurEcommerce software.



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"Fast-cycle logisitics will demand a new level of visibility and control within the organization to manage inventory in motion."

David Roussain, vice president of electronic commerce marketing, Federal Express

The second category, supply-chain planning, includes i2 Technologies, Manugistics and iLog.

The two SCM software categories together generated revenue last year of $3.1 billion, a number expected to grow to $4.5 billion this year, according to AMR. In addition, ERP vendors, primarily Oracle and SAP, are also fielding SCM-style products. AMR estimates its SCM sales hit $522 million last year and will increase to $928 million this year. Of course, users also still roll their own SCM programs.

Oracle's 11i, which shipped earlier this year, seeks to cover supply-chain execution and planning in Web-based style. Chicago company Marketing Out of the Box — one of the new generation of fulfillment houses for dot-com retailers such as Blue Fly and send.com — spent millions on this Oracle software.

Marketing Out of the Box receives orders electronically direct from its clients' commerce sites. As the fulfillment house, it also receives goods from manufacturers and suppliers on behalf of dot-coms. Co-CEO David Neuberger says the company's 125 employees work to take these bar-coded items and wirelessly scan data from them into the Unix-based Oracle software. It's a pick, pack and ship operation, charging about $2 per order.

Working with software the e-fulfillment house wrote to report to clients' Web sites, the Oracle application tracks shipping and inventory, which is made available to outsiders, including consumers at times.

"We chose Oracle because we thought it was the only one out there that was really Web-based," Neuberger says, emphasizing his firm did an extensive review of SCM software.

The options for outsourcing fulfillment are mushrooming. Federal Express, well-known for shipping packages, has also gotten into business-to-business SCM.

Hewlett-Packard and garden.com are among the companies using supply-chain services to store goods in a FedEx warehouse, with FedEx shipping inventoried items when an order comes in over the Web.

"We distribute data every 15 minutes to HP to give them the inventory status," says David Roussain, vice president of FedEx e-commerce marketing. "Fast-cycle logistics will demand a new level of visibility and control within the organization to manage inventory in motion."

Online SCM services also are attracting attention from corporations that say their older electronic data interchange-based SCM systems can't give them the kind of real-time activity view they want.

General Mills, for example, will soon start using the Nistevo hosted freight-shipping management service, which is priced at $6,500 per seat, per year.

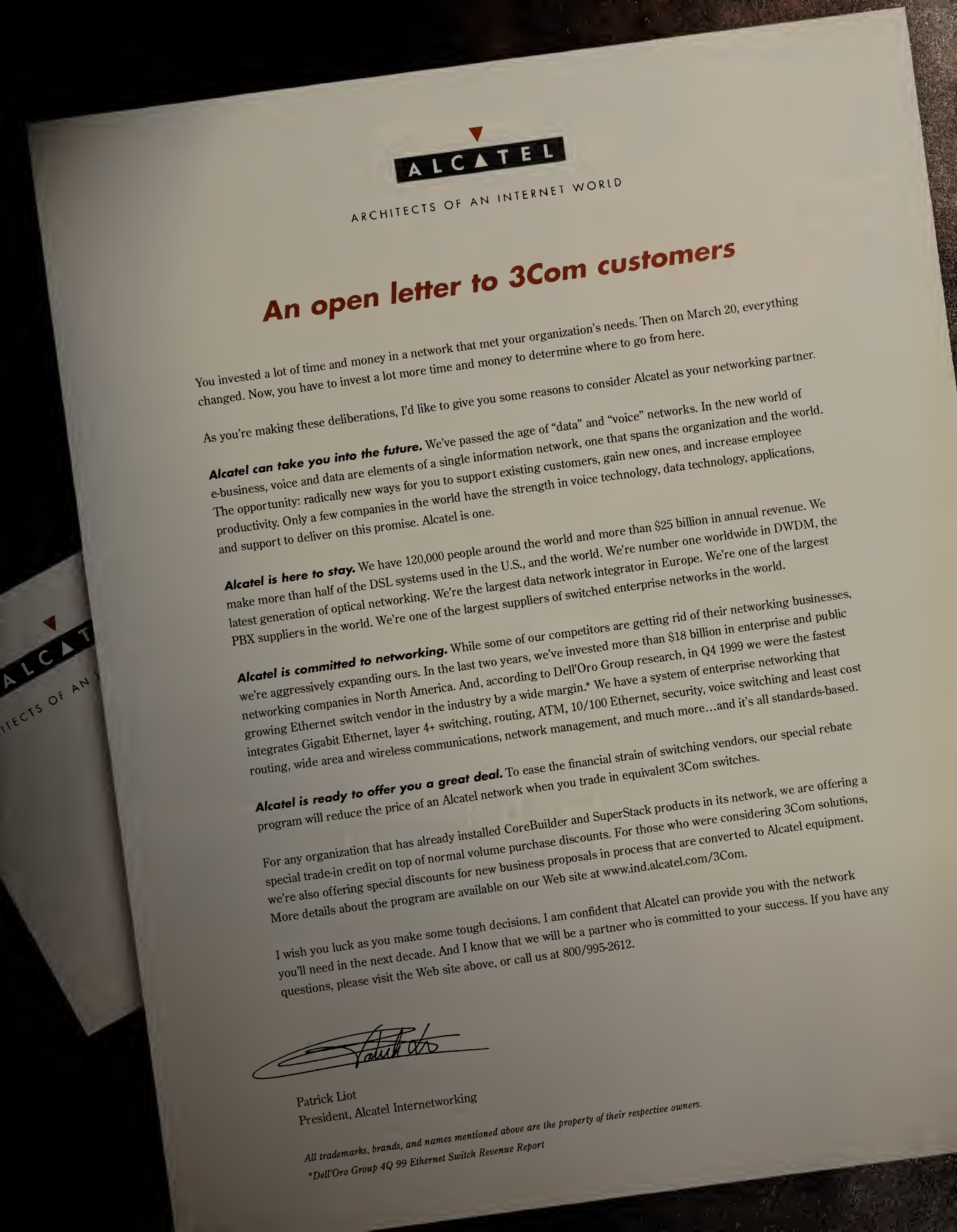
"It will help dramatically with our contracting with our carriers, such as Crete, Hartland and JD Hunt," says Randy Darcy, a senior vice president at General Mills, who says he encouraged the shippers to link their internal systems to Nistevo.

Until now, General Mills has relied on EDI-based messaging, or phone and fax, to get business data into its SCM systems. The corporation uses its own SCM software and a package from Manugistics.

"The Nistevo service is going to completely change how we do contracting," Darcy says, pointing out that it should simplify scheduling of back-haul transportation deliveries in cooperation with other corporations willing to share routes.

For users, it's not easy choosing the right SCM software or service as e-commerce alters expectations, acknowledges IBM. The company doesn't sell its own supply-chain software but is often tapped for its systems integration expertise on SCM projects.

It's important to know that SCM vendors tend to cater to specific industries, such as Retek for apparel retailers and Lilly Software for electronics and fabrication, IBM Marketing Manager Richard Ruiz says. He adds that because SCM is global, it makes sense to investigate whether non-U.S.-based SCM vendors might also be the right fit. ◪


ALCAT
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ARCHITECTS OF AN INTERNET WORLD

An open letter to 3Com customers

You invested a lot of time and money in a network that met your organization's needs. Then on March 20, everything changed. Now, you have to invest a lot more time and money to determine where to go from here.

As you're making these deliberations, I'd like to give you some reasons to consider Alcatel as your networking partner.

Alcatel can take you into the future. We've passed the age of "data" and "voice" networks. In the new world of e-business, voice and data are elements of a single information network, one that spans the organization and the world. The opportunity: radically new ways for you to support existing customers, gain new ones, and increase employee productivity. Only a few companies in the world have the strength in voice technology, data technology, applications, and support to deliver on this promise. Alcatel is one.

Alcatel is here to stay. We have 120,000 people around the world and more than $25 billion in annual revenue. We make more than half of the DSL systems used in the U.S., and the world. We're number one worldwide in DWDM, the latest generation of optical networking. We're the largest data network integrator in Europe. We're one of the largest PBX suppliers in the world. We're one of the largest suppliers of switched enterprise networks in the world.

Alcatel is committed to networking. While some of our competitors are getting rid of their networking businesses, we're aggressively expanding ours. In the last two years, we've invested more than $18 billion in enterprise and public networking companies in North America. And, according to Dell'Oro Group research, in Q4 1999 we were the fastest growing Ethernet switch vendor in the industry by a wide margin.* We have a system of enterprise networking that integrates Gigabit Ethernet, layer 4+ switching, routing, ATM, 10/100 Ethernet, security, voice switching and least cost routing, wide area and wireless communications, network management, and much more…and it's all standards-based.

Alcatel is ready to offer you a great deal. To ease the financial strain of switching vendors, our special rebate program will reduce the price of an Alcatel network when you trade in equivalent 3Com switches.

For any organization that has already installed CoreBuilder and SuperStack products in its network, we are offering a special trade-in credit on top of normal volume purchase discounts. For those who were considering 3Com solutions, we're also offering special discounts for new business proposals in process that are converted to Alcatel equipment. More details about the program are available on our Web site at www.ind.alcatel.com/3Com.

I wish you luck as you make some tough decisions. I am confident that Alcatel can provide you with the network you'll need in the next decade. And I know that we will be a partner who is committed to your success. If you have any questions, please visit the Web site above, or call us at 800/995-2612.

Patrick Liot
President, Alcatel Internetworking

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**Dell'Oro Group 4Q 99 Ethernet Switch Revenue Report*

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Technology Update

An Inside Look at the Technologies and Standards Shaping Your Network

Making optical networks more flexible

BY PRABHU KAVI

As a result of the demand for more bandwidth, service providers are faced with the challenge of delivering bandwidth when and where customers need it.

Consider what happens when a best-selling author publishes a new book and makes it available only via the Internet, as with Stephen King's recently released *Riding the Bullet*. Network overloads are likely if a deluge of consumers tries to download the book simultaneously. While additional bandwidth would help, adding it takes months, and there is no way to precisely forecast when and where it will be needed.

In recognition of this problem, a new industry coalition, Optical Domain Service Interconnect (ODSI), was formed to drive innovation in service creation and bandwidth delivery for high-speed optical networks.

ODSI has identified two distinct but complementary functional elements of the optical network infrastructure: the transport network and the service network. Transport networks create abundant raw capacity, while service networks translate this capacity into business and consumer services such as Internet access, LAN-to-LAN connectivity and extranets.

Optical transport networks create capacity by using dense wave division multiplexing (DWDM) technology to carry a large number of high-speed connections over a single pair of fiber optics. DWDM equipment available today can carry more than 100 connections at OC-48 (approximately 2.5G bit/sec each) or 40 connections at OC-192 (approximately 10G bit/sec each). However, optical transport networks are unable to look inside the contents of each connection to make switching or routing decisions at the packet or cell level. Instead, optical transport networks perform a function analogous to what airplanes provide overnight delivery companies: fast and efficient delivery between two fixed endpoints without having to know the contents of each package.

Optical service networks are typically composed of IP routers, ATM or frame relay switches, or newer products called Optical Service Switches that combine these functions into a single platform. These devices use the optical transport network to connect to each other at OC-48 or OC-192 speeds. But unlike optical transport networks, they inspect the packets or cells carried on each connection. Continuing the overnight delivery analogy, optical service networks perform the function of overnight carriers' regional service centers, making intelligent switching or routing decisions of each package, plus applying queuing and measurement policies to deliver the service level expected by customers.

The goal of ODSI is to enable service networks to rapidly dial up additional bandwidth from transport networks to meet the needs of applications. ODSI is working to create a standardized signaling interface between optical service networks and optical transport networks by applying extensions to the existing IP and Multi-protocol Label Switching protocols.

This signaling interface allows a switch or router to request a new connection (at OC-192 speeds, for example) to another switch or router within the network. The request may also have additional constraints, such as low latency or a fast recovery if a fiber cut occurs in an optical transport network. The optical transport network attempts to find a path between the source and destination that meets the constraints. If the request succeeds, additional bandwidth can be created within seconds.

To date, the ODSI coalition has created a baseline document describing its goals, and has identified the IP and MPLS protocols that need to be extended. The coalition intends to create a complete protocol specification by midsummer. It will then conduct interoperability testing and provide technical recommendations to industry standards organizations such as the Internet Engineering Task Force and Optical Internetworking Forum. Interoperable implementations of ODSI are expected for commercial deployment by year-end.

When ODSI is deployed, service providers can rapidly respond to changing network conditions. If the service network is overloaded, such as when the next bestseller is available only online, ODSI allows additional bandwidth to be instantly created upon demand, leading to more satisfied consumers and increased sales.

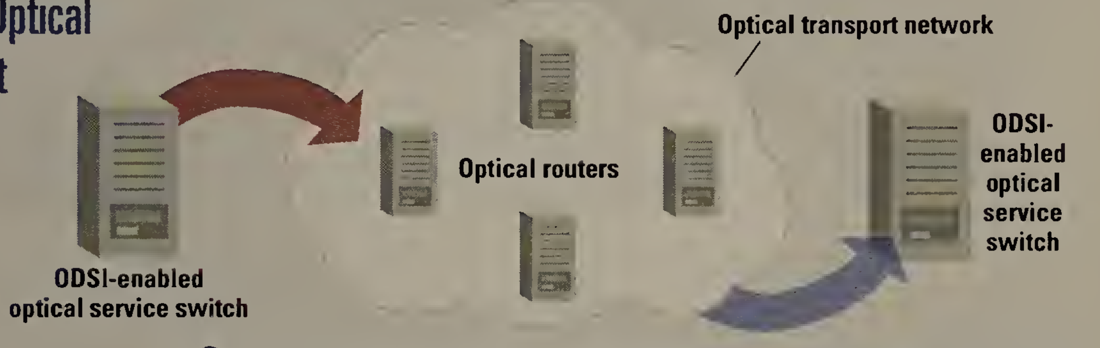
Kavi is director of product management at Tenor Networks. He can be reached at prabhu_kavi@tenornetworks.com

HOW IT WORKS

Adding bandwidth through Optical Domain Service Interconnect

Optical Domain Service Interconnect (ODSI) is being designed as a standard method of rapidly acquiring optical bandwidth. This standardized signaling interface will be accomplished initially through extensions to IP and Multiprotocol Label Switching.

❶ The signaling interface of the ODSI-enabled optical service switch or router requests a new connection at OC-192. The request may also call for low latency or the ability to recover quickly should a fiber cut occur in the transport network.


Optical transport network
Optical routers
ODSI-enabled optical service switch
ODSI-enabled optical service switch

❷ The optical transport network tries to discover a path between the source and the destination that meets the criteria spelled out by ODSI. Provided the request can be fulfilled successfully, the additional bandwidth is created within seconds.

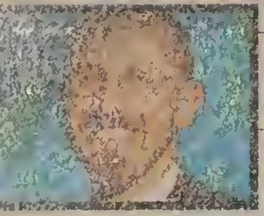
Ask Dr. Intranet

By Steve Blass

I'm having some trouble getting a VeriSign digital certificate installed in our iPlanet 4.0SP2 Web server running on a Hewlett-Packard-UX 11.00 system. When I tried to install the certificate using the Web-based manager, I got a JavaScript application error: "Unexpected failure: cannot write. There was an error while writing certificate file." I checked the file and directory permissions in the https-<server> and https-<server>/config directories. I also checked the permission settings on the trust databases in /opt/netscape/server4/alias, as well as for that directory. The problem seems to be something else. I can install the certificate against the administration server (https-admserv). I need to install it for the correct individual server instance.

The trouble is probably more of an administrative issue than a technical one. The problem is in generating the Certificate Signing Request (CSR) from the main Enterprise Administrative Server rather than from the individual server instance the certificate was for. This differs from the documentation found by searching for CSR at www.iPlanet.com and following the link to "Issuing and Managing End-Entity Certificates." Instructions for installing CSRs under Version 4.X servers can be found at http://developer.netscape.com/docs/manuals/console/41/admin/5_secure.htm.

Blass is a network architect at Sprint Paranet in Houston. He can be reached at dr.intranet@paranet.com.



Gearhead — inside the network machine . **Mark Gibbs**

SOUND TRICKS FOR DIGITAL MUSIC

Having spent the past four weeks discussing a multimedia operating system (BeOS), media has been on Gearhead's mind. Moreover, because our evil twin in the "Backspin" column has been opining about Napster, Gearhead thinks it's time to take a look at the MP3 audio encoding system.

MP3 is an abbreviation for MPEG-1 Layer 3, an open standard for music compression defined in 1991 by the Moving Picture Experts Group, a working group of the International Standards Organization (www.iso.ch/) and the International Electrotechnical Commission (www.iec.ch/).

MPEG-1 is actually a collection of complex standards. According to the MPEG site (www.cselt.it/mpeg/), MPEG-1 is for "coding of moving pictures and associated audio for digital storage media at up to about 1.5M bit/sec."

MP3 compresses music data by a factor of up to 15-to-1, while attempting to minimize perceived (not actual) quality loss. In other words, despite the radical compression ratio and bits being tossed out, Metallica still sounds like Metallica (Gearhead suspects the loss of most bits would leave a Metallica ditty intact as far as the ear could tell; preserving the nuances of Brahms or Bach is an entirely different matter).

MP3 uses a number of techniques, commonly referred to as perceptual coding, that let us decide what data we can throw out by analyzing the frequency and energy distribution of the music in various ways and relating that to a psycho-acoustical model of human hearing.

The minimal audition threshold is a technique that relies on the idea that the ear responds nonlinearly to sound, according to the law of Fletcher and Munson (http://web.wt.net/~rg21518/fletcher.html).

In the context of MP3, the law means you can ignore sounds under a range of frequency thresholds, depending on how loud they are, because they will not be heard.

This basically involves determining which sounds are blocked by other sounds as far as the human ear is concerned. Thus, a trumpet playing a soft note will be masked on and off if played along with, say, a French horn section.

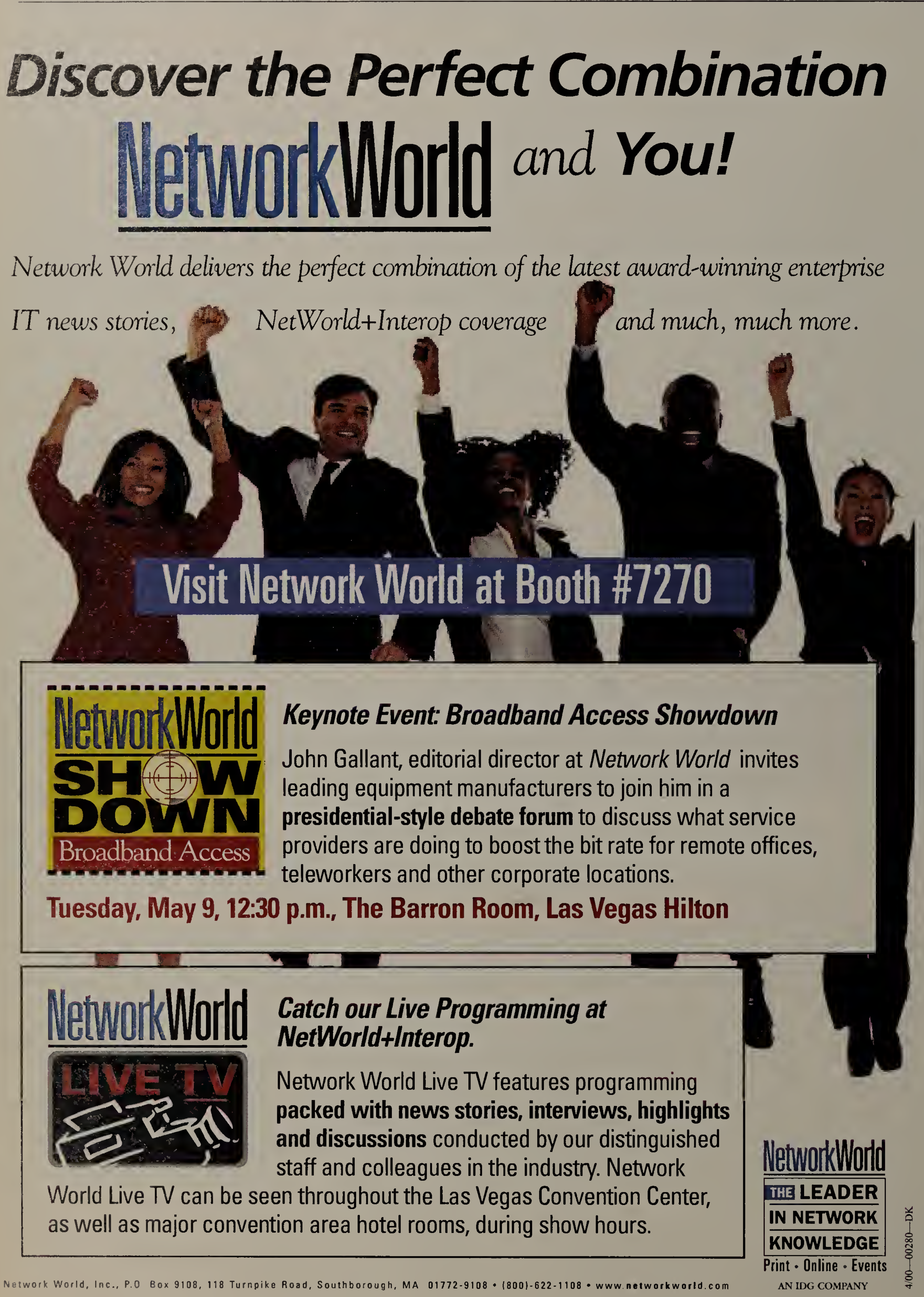
Another MP3 perceptual coding technique is known as the reservoir of bytes, the method of allowing different segments of an MP3 file to be encoded at different bit rates. This means encoding accuracy can be reduced according to the psycho-acoustical model, which removes data based on how the ear receives sound and the brain perceives it.

MP3 also uses something called Joint Stereo that reduces stereo data. This can be done because the low frequency components of the music aren't as important to stereo imaging as high frequencies. Therefore, the stereo components of the bass end of the music can be combined into a mono image, providing another way of tossing out data.

Finally, Huffman coding is performed on the modified data. This doesn't compress the data further, but stores the data efficiently.

Doing all this encoding has its complexities, which we will discuss next week, along with encoding and decoding software.

Sound off to gb@gibbs.com.



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Editorial

Where do 3Com users go from here?

The life is finally draining out of the Network World Fusion forum about 3Com retreating from the enterprise network market, but what a tale it told.

Not surprisingly, customers are shocked, confused and bitter. "I just purchased $150K of Corebuilder 9000's. Now what?" said one user in the Fusion forum. "With capital budgets set for FY2000 and FY2001, this is going to be a neat trick to switch to another manufacturer."

Most will have to squeeze what they can out of the gear and worry about replacements down the road. As a Fusion reader said: "With our upgrades we are fine for the next two to three years, and warranty and service programs will cover us. However, there are gigabit options we wanted to explore this summer which are now in question. Very frustrating. Interoperability could be a big issue."

There simply isn't any getting around the fact that life is going to get complicated for customers that bought into the 3Com story. And most, it seems, aren't buying 3Com's exit strategy. Asked if they would take 3Com's advice and migrate to Extreme for large-scale LAN switching and Motorola for WAN switching, readers in a Fusion poll gave a resounding "no." Of the 532 people that had participated in the online survey as of April 26, 71% said no, 15% said yes and the rest said they didn't know yet.

What will they do instead? That's unclear, but Nortel, Hewlett-Packard, Alcatel and others see blood in the water and are circling. Cisco, in fact, has revised the trade-in values spelled out in its Competitive Technology Migration Plan, specifically to lure 3Com customers.

According to Cisco's Web site, the CTMP program offers qualified partners and resellers up to 52% off list price. Extreme says it will knock 70% off the price of its BlackDiamond broadband chassis for 3Com customers that ordered CoreBuilder 9000 switches in the last year. The Cisco and Extreme programs end Sept. 30.

Cisco is smart to target 3Com's resellers because they are just as miffed as the end users. "This announcement leaves many resellers in legal and financial peril," said one user in the Fusion forum.

Will 3Com find success with its strategy? Not if that success depends in any part on this customer and reseller base, many of which don't want anything more to do with the company.

— John Dix
Editor in chief
jdix@nww.com

Message Queue

DISARMING HACKERS

Regarding Winn Schwartau's column "An effective way to disarm online muggers" (April 3, page 59):

It would be nice to be able to take an active response that could affect attackers. But assurance is never going to be completely there, regardless of what you do.

The proposal for an online Caller ID system is ludicrous. It does not solve the problem, and effectively gives would-be attackers a new method to exploit — one that would result in an innocent patsy getting hauled in by the police or FBI. Furthermore, it lulls system and network administrators into assuming that anything with an ID is somehow valid and not a security threat.

It has been proven time and again that no matter what is done to prevent attacks, new ways are almost always found. There is no substitute for vigilance, monitoring and good security practices.

Renato Sabolboro
Oakdale, Pa.

The idea of an Internet Caller ID system or the concept of ignoring anonymous requests is disturbing to me. I'm not a computer professional, but I value what remains of my online privacy. I'm also not a hacker or a threat to anyone's server, but I concede that such people are out there. So while I can't be sure how effective it is, I set my browser to disable cookies, run special software on my machine to safeguard my privacy and don't keep personal information on my system. Can I be sure these methods are effective? No. Am I alone in this thinking? Probably not. But do I want to be required to have my machine give out information about me every time I want to access a Web site? Unequivocally, no.

Olivier Kozlowski
Attorney
Mansfield, Mass.

I see one big problem (besides the legalities) with using offensive methods to shut down hackers. What would prevent a hacker from pitting two such systems against each other? The hacker could simply start a small denial-of-service attack against Company A and spoof his IP address to make it appear to come from Company B. Then Company A responds offensively to Company B, and Company B then returns fire, creating an endless loop.

Unless spoofing can be eliminated, which is unlikely, you would essentially be creating a distributed denial-of-service infrastructure for hackers.

Keith Royster
Technical systems engineer I
Implementation Design Services
Bank of America
Charlotte, N.C.

Internet users should not be able to use other people's equipment for free without any accountability. How can private rights be of greater value than public rights on a public network?

I do not respect or appreciate the efforts of hackers to reveal security flaws. They are like teenagers walking down a street and trying to open the front door of a house to test the lock. They do not have the right to enter the house if it is unlocked. Just because I leave my car unlocked doesn't mean someone can climb in and take it for a test drive to prove a point.

Ted Bouskill
Vancouver

TAKING STOCK

I enjoyed Kevin Tolly's observations concerning recent changes in network companies ("Network riptide — acquisitions and spinoffs," April 3, page 30). It seems this industry is simply a more extreme example of the general corporate mind-set of many publicly held companies today.

Currently, stock price seems to drive strategic decisions more than things like sales, service or other mundane issues. From cookies (Nabisco) to networking (Cisco), the measure of true success seems to be the stock price. What is interesting to me, and what I fail to fully understand, is why this is so.

Bill Flowers
Tempe, Ariz.

Send letters to nwnews@nww.com or John Dix, editor in chief, Network World, *118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.*

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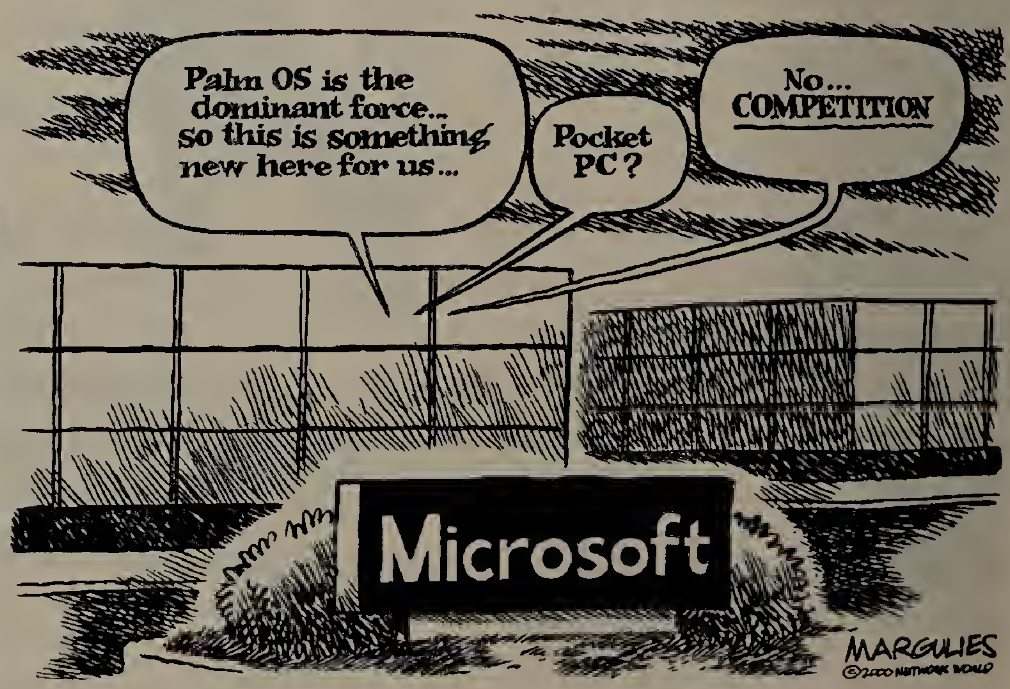

Palm OS is the dominant force... so this is something new here for us...
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Management Mode . Jeff Shapiro

CONVERGENCE? NO THANKS, I GAVE AT THE (PRINCIPAL'S) OFFICE

All the talk about convergence — merging voice, data and video streams in a common access pipe with common equipment — makes it seem like something new and wonderful. In reality, it's not either. Schools have been converging their systems for years in answer to some very specific needs and for some very specific savings in time and money.

It used to be that telephones were located only in the principal's office, the nurse's clinic and the teacher's workroom. Telephones in the classrooms were unheard of. Today, there are phones in classrooms for three reasons — they're useful, improve safety and can be used to control things.

In modern schools, the phone switch is integrated with a paging and intercom system. This makes sense because most phone systems already have that capability. If you already have speakers in the school's ceilings and corridors, why not use them as bells, too? Another needed function is thus converged into the system.

Modern classrooms need computers, which are hooked to networks that are hooked to the Internet. Because we're putting phone jacks everywhere, let's put network cable in the same places and install it all at once. We'll put switches or hubs in the same cabinet that the phone system occupies.

We need some way of distributing video into the classrooms, too. A multichannel video distribution system will be just the ticket, with televisions in each room hooked to common sources. We'll need to control those sources, so let's hook the video system into the phones and let teachers order what they need from the keypad. What about clocks? Well, we already have TVs, so let's just create a "clock channel" on the video system, with constant time display whenever anyone selects that channel. While we're at it, let's put an "announcement channel" on there, too.

What do you end up with? An integrated, converged system created to solve a specific problem set, and you save money. These systems have been available for at least five years, and systems with slightly lesser capabilities have been available for 10 years. Contrast this system with what the major telephone company's are preparing to offer in converged systems and it will seem like night and day.

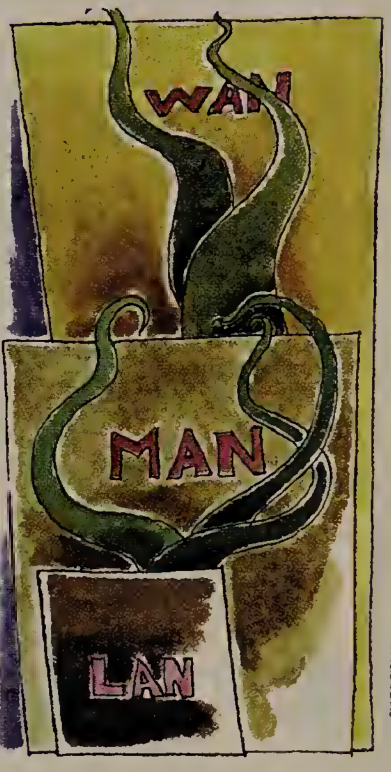
What we need to realize is that the "new convergence" isn't primarily intended for our benefit, but rather for the telco's. By bundling all the services you need into a single-delivery method, you've locked yourself into that vendor. If someone else offers better or less expensive data service, you can't pull your data out of the pipe. Converged-delivery methods also save the vendor a lot of money, significantly reducing the number and types of wire they have to bring you, along with the associated central office equipment and maintenance requirements.

What do we get? Lower prices (initially) and all of our eggs in one basket, even if it is a fully redundant, battery-backed-up basket. But where is the true benefit here, and which of my problems is it intended to solve? I certainly can't tell.

Shapiro is district technology coordinator for Kingsport City Schools in Tennessee. He can be reached at jshapiro@kpt.k12.tn.us.

The Intelligent Network . Mary Petrosky

ETHERNET REACHES INTO THE MAN — AND BEYOND



FRANCIS BLAKE

If I offered you twice the bandwidth of your current metropolitan-area network (MAN) at half the cost, would you be interested? That proposition is attracting customers to a new breed of MAN service providers that are building fast, inexpensive networks using off-the-shelf Gigabit Ethernet switches, optical technologies such as wave division multiplexing and installed fiber-optic cabling.

Telseon in Palo Alto is the newest service provider to jump into the metro market, offering customers a fully managed Ethernet MAN service. Earlier this year, another Bay area company called Yipes launched a similar service. Both companies plan to introduce their offerings in major metro markets throughout the U.S. and are also eyeing European and Asian markets.

The Ethernet metro market is hot, and that fact has not been lost on networking vendors. Extreme Networks, which has been selling equipment to Yipes and others building Ethernet-based MANs, recently announced a switch aimed at the metro market as well as the formation of a business unit focused on service providers. Similarly, Cisco Systems several weeks ago quietly created a metropolitan services business unit. Nortel Networks in March launched its optical Ethernet product line and announced deals with service providers in Scandinavia and Canada.

Why the growing interest in Ethernet-based MANs? They're fast, cheap and easy to deploy and manage. They address the pent-up demand for more bandwidth in the metro area and offer a compelling alternative to traditional MAN services. Historically, local network speeds have outstripped MAN and WAN speeds. Over the past few years, however, service providers have been building out their backbones, dramatically increasing the bandwidth in WAN cores. This has led to a bandwidth crunch in the metro area.

Service providers such as Telseon and Yipes are addressing that bandwidth problem by allowing customers to purchase bandwidth in 1M-bit increments up to a full gigabit. In addition to providing flexible amounts of bandwidth, these Ethernet MAN services are cheaper than T-1 and DS-3 lines in terms of the cost per megabit of data moved. More important for some customers, the provisioning cycle for these new Ethernet-based services typically takes half the time of their traditional counterparts. (Actual installation times vary based on the availability of fiber to a given customer site. Getting fiber to your doorstep is the hardest part of these service installations.)

And in a dramatic break from traditional telco-style services, Telseon and Yipes can increase the data rate on an existing link in less than 24 hours. Telseon goes so far as to give customers control over bandwidth provisioning, supplying a Web-based interface that allows customers to turn up the bandwidth on a link in a matter of minutes. This contrasts with the three to five weeks one IT manager noted it took his service provider to increase the committed information rate on his frame relay links.

For many enterprises, the availability of Ethernet-based metro services addresses another problem — the shortage of IT workers. In the Bay area, for example, dot-com fever has decimated many IT staffs. Using Ethernet-based MAN services eliminates the need for SONET, ATM and other traditional MAN/WAN gear. This results in tremendous savings, not only in equipment costs, but also in operations staff.

These new offerings are dramatically changing the cost model for IP data services. What's less clear is how quickly and how well they will handle voice traffic. Extreme Networks is trying to tackle voice and video as well as data in its new MAN switch line, the Alpine 3800. These switches include a feature called IP time-division multiplexing that's designed to provide circuit emulation so that voice and video traffic get guaranteed latencies. If the technology proves successful, other vendors undoubtedly will begin offering similar capabilities.

We can also expect Ethernet's reach to get longer. Vendors such as Extreme and Foundry Networks already support Gigabit Ethernet running over single-mode fiber at up to 150 kilometers. Optical switching and related advancements will push those distances even further. Keep your eyes open for Ethernet WANs.

Petrosky is an independent technology analyst based in San Mateo, Calif. She can be reached at mary@mpetrosky.com.

THE OTHER

Video over IP emerges as an alternative to ISDN-based videoconferencing.

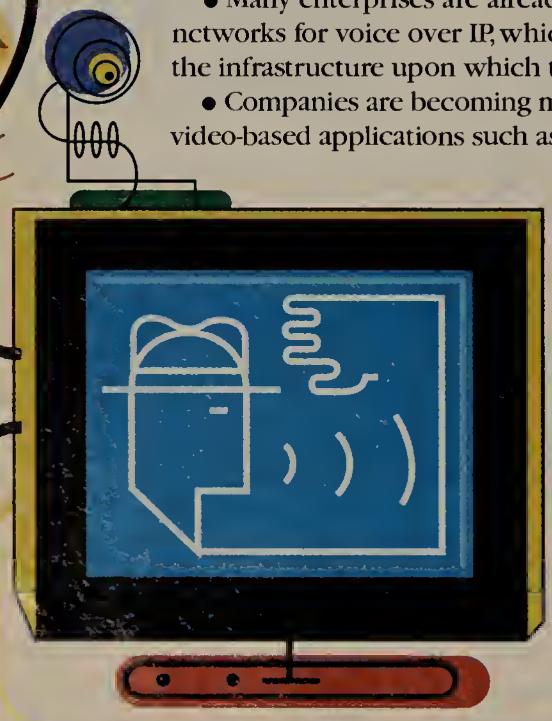
BY EVAN ROSEN

IP-based videoconferencing is coming on strong as a successor to ISDN-based systems for cost-effective, application-rich corporate videoconferencing.

Videoconferencing has always had the potential to save your company money and improve productivity by linking virtual teams in a high-impact communication and collaboration environment, regardless of geography. But the technology, typically based on ISDN connections over the public switched telephone network (PSTN), has been hampered by poor quality, implementation problems and high costs.

However, several factors are coming together to kick-start IP-based videoconferencing:

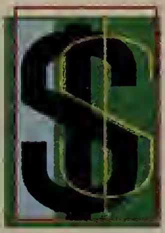
- Most standard videoconferencing products today are designed to accommodate ISDN and IP implementations.
- Vendors are starting to offer IP-based videoconferencing services.
- Many enterprises are already preparing their networks for voice over IP, which also provides the infrastructure upon which to add video.
- Companies are becoming more interested in video-based applications such as the multicasting of corporate events and training sessions, video-based collaboration among employees in different places and making video-on-demand available to employees.
- Vendors are beginning to offer IP-based packages that include straight videoconferencing as well as streaming video options.



The market for videoconferencing products was relatively small in 1999, totaling $202 million for products that support IP and ISDN, and only $7 million for IP-only products, according to Wainhouse Research in Brookline, Mass. But Wainhouse predicts that by 2005, the IP videoconferencing market will reach $1.6 billion and $1.2 billion of the total will be IP-based products.

Of course, not all analysts are convinced the IP videoconferencing revolution will happen that rapidly. "To have 50% of all videoconferencing systems deployed by 2005 on IP networks is very optimistic," says Roopam Jain, an analyst at the Mountain View, Calif., market research firm Frost & Sullivan. But Jain and other analysts agree that the trend toward IP is clear.

If you're considering a videoconferencing application and are debating whether to go with an IP or an ISDN implementation, here are the issues you need to think about:



1. Cost

Because most current videoconferencing systems support ISDN and IP, the investment in endpoint technology is the same.

When it comes to transport costs, ISDN varies widely in different regions of the U.S. For 128K bit/sec ISDN, the basic line cost might be $35 per month. In some locations, flat-rate, all-you-can-eat ISDN services are offered, but in other cases you may have to pay a per-minute usage cost ranging from 40 to 70 cents. ISDN calls at 384K bit/sec could triple that cost.

By contrast, there's no separate per-minute cost for IP because it runs over your IP-based data network or over a flat-fee service such as a virtual private network (VPN). However, the IP approach will likely require network upgrades to provide the bandwidth necessary for high-quality video.

"I wouldn't call the cost comparison a no-brainer," says Andrew Davis, managing partner of Wainhouse Research. "If you go with ISDN, you have known costs. You pay by the minute. You have known technology, but you are doomed to live with an unreliable technology. You are committing to a system divorced from the rest of your enterprise."

Davis adds that with IP, "You have to beef up your network and beef up your support team. You'll save money on ISDN, but you'll spend it on more infrastructure and network support." However, IP does provide a converged network of voice, data and video that is more logical and efficient for the long term, he says.

Summit Solutions, a systems integrator in Kansas City, Kan., specializes in videoconferencing over IP for government customers. "When we looked at H.320 ISDN [for customers], it was cost prohibitive," says Dale Hanson, project manager for Summit Solutions. "You spend all of this money putting videoconferencing in and then you tell people not to use it because it's too costly. With IP videoconferencing, you encourage people to use it because the cost per call goes down the more you use it."

2. Quality-of-service questions

When you talk about implementing videoconferencing over IP, the first issue that arises is the lack of guaranteed quality of service (QoS).

While a company can deploy and control QoS on its own LAN, the problem is sending video from one LAN to another LAN that may not support QoS. Because there are no end-to-end QoS standards yet, analysts recommend using one network vendor rather than mixing and matching.

The other approach, of course, is to simply add bandwidth. The U.S. Census Bureau is using 50 Polycom ViewStation systems running over IP at 768K bit/sec. Most of the units are spread around small conference rooms at headquarter buildings in Maryland, but about 15 are at the bureau's National Processing Center in Jeffersonville, Ind.

"Our managers use videoconferencing to talk about how to change procedures, the status of data capture and the status of census activity in the field," says Larry Patin, chief of the Census Bureau's telecommunications office.

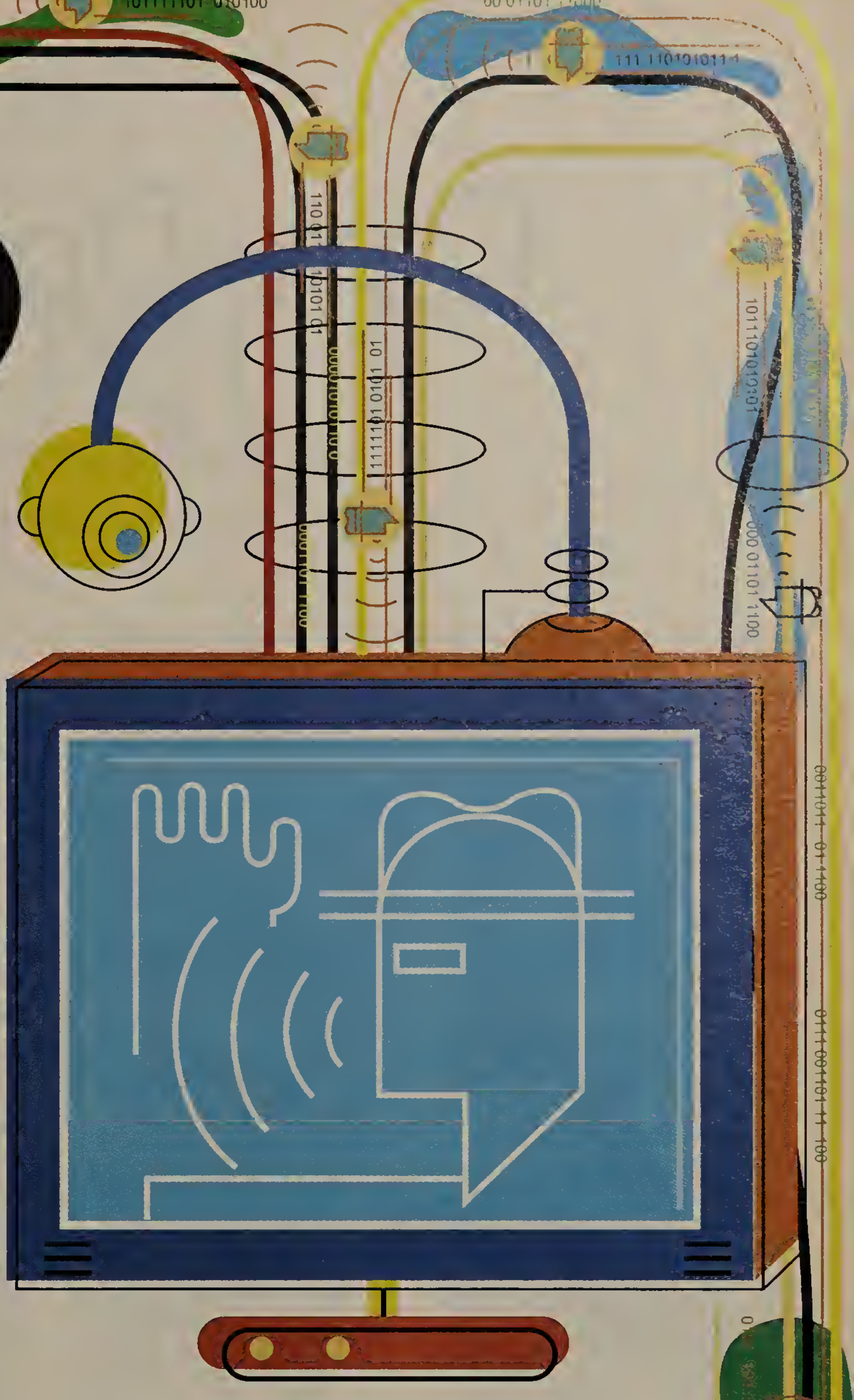
Patin says his team is deploying Cisco 6500 routers to provide a 1G bit/sec backbone. That's enough bandwidth to eliminate any traffic problems.

3. Transition

If you already have an ISDN implementation and you're thinking of transitioning to IP, you'll need to think about gateways.

Typically, IP videoconferencing uses the H.323 international standard. Most current implementations include gateways into the H.320 ISDN-oriented PSTN. This allows companies to use IP for video calls within the enterprise and ISDN over the PSTN for calls to

VoIP


HANK OSUNA

branch offices and other companies. This is an important capability because many companies are using legacy videoconferencing systems that support only ISDN. Also, without end-to-end QoS standards there are problems videoconferencing LAN to LAN over IP.

So a firm that deploys IP videoconferencing often needs a gateway to communicate with customers, suppliers, business partners and others who are using ISDN. This gateway approach requires hardware supplied by vendors such as Cisco and RADVision to translate between the H.323 packet-switched and H.320 circuit-switched worlds.

For example, the Census Bureau is using Cisco multipoint control units and Cisco gateways that translate between the H.323 and H.320 protocols.

Another solution is to use a VPN that provides gateway services.

4. VPN or public Internet?

While it may be a few years before IT departments feel comfortable using the Internet for business-critical videoconferencing, VPNs are filling the void.

Prudential Select Brokerage in Newark, N.J., is running video over its LAN within the enterprise and using an AT&T VPN to link its field offices, says Chuck Anderson, vice president of IS.

To manage video traffic more efficiently and to support IP Multicasting — in which one video stream is sent to many recipients — the company is upgrading its network, Anderson says.

As one example of a VPN service, All Communications of Hillside, N.J., is offering a global VPN for videoconferencing with a full-scale rollout planned for late summer. The IP network will support QoS. The company, which is changing its name to Wire One Technologies, is partnering with Covad Communications to provide digital subscriber line connections to its VPN. Company officials estimate they will deliver videoconferencing network services for 40% to 60% less than ISDN services.

5. Applications

IP provides convergence of all multimedia, including one-way streaming, over the same network. In contrast, many ISDN-oriented videoconferencing systems are islands of technology that fail to integrate other applications.

For example, Anderson at Prudential Select Brokerage started with ISDN-based videoconferencing as a way to link sales associates at field offices with headquarters for training in complex products, Internal Revenue Service regulations and legal developments. He also wanted to use videoconferencing for system-design sessions for the IS staff.

Anderson chose Polycom as the vendor, primarily because Polycom ViewStation products offer integrated videoconferencing and one-way streaming video. "We got into this with Polycom on the ISDN point-to-point front, but it has quickly moved into an IP implementation," Anderson says. Prudential Select Brokerage is deploying IP videoconferencing at 175 field offices throughout the U.S.

Credit Suisse First Boston (CSFB) is upgrading its network to support a variety of IP-based video applications, including streaming video, video on demand and videoconferencing, says Ira Weinstein, global department head of media services.

CSFB has been using videoconferencing for the past five years for analyst briefings, management meetings, corporate presentations and job interviews. The company holds an average of 30 room-to-room videoconferences per day.

Weinstein says he expects that IP will allow CSFB to extend videoconferencing to individual end users. "We're looking for desktop videoconferencing to keep people at their core work locations doing business. When they get up from their desks for conferences and meetings, we're losing money," he says.

Wait-and-see approach

But CSFB also is approaching IP videoconferencing with caution. "We currently have IP videoconferencing in our lab. We're not thrilled with the performance or system management functions, and are not yet ready to deploy," Weinstein says.

The company expects to implement streaming and video on demand by June and conduct IP videoconferencing pilots in the fall.

"I don't think there is any doubt that the whole world is moving to IP" says Malcolm Wollaston, global telecommunications manager for 3M in St. Paul, Minn.

3M uses 250 videoconferencing systems worldwide, mostly PictureTel Concorde systems, and some Polycom ViewStations. Since its data network is overloaded, 3M is upgrading to accommodate IP videoconferencing. By September, Wollaston says 3M will conduct IP videoconferencing pilot programs.

The bottom line

While legacy PSTN-oriented videoconferencing systems will continue as the main workhorses of visual communications over the next year, IP videoconferencing is gaining momentum. There are pros and cons to each approach.

Based on his experience at the Census Bureau, Patin says, "The biggest problem with IP is network design and what you've got in place. If you have bottlenecks or traffic problems, IP videoconferencing will not work."

Prudential Select Brokerage's Anderson says a key benefit of deploying IP videoconferencing is avoiding the provisioning and reliability issues of ISDN. These include installation delays and losing the connection in the middle of a call. "The telephone company issue alone has been frustrating for us and so has the cost," Anderson says.

Many IT executives are looking at IP videoconferencing products. As they plan network upgrades, video is increasingly a consideration. The promise of less expensive, more efficient video traffic over IP will make videoconferencing more viable enterprisewide.

Rosen is chief strategist with Impact Video Communication in San Francisco and the author of Personal Videoconferencing. *He can be reached at erosen@impactvid.com.*

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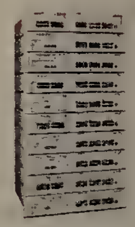
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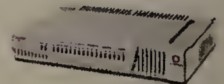
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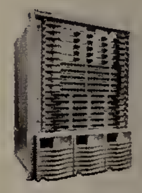
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PARSING WITH PRECISION

Hardware-based Layer 5 load balancers offer sophisticated traffic management for e-commerce.

BY TONY BOURKE

JENNIFER HEWITSO/SIS

One of the hottest areas in networking today is Layer 4 load balancing, a function that's increasingly vital for the smooth operation of a company's e-business site.

There are two basic types of load balancers: Server-based and hardware-based. A server-based load balancer runs on a standard operating system on a PC box. Special software runs on top of the operating system to perform the load-balancing functions.

Hardware-based load balancers, typically running on a switch, employ an Application Specific Integrated Circuit (ASIC) chip to perform the basic IP functions associated with load balancers. ASICs are chips with the software for a specific function hard-wired into the circuitry, rather than a chip with a general instruction set, such as a Pentium.

The advantage of having the software hard-coded into a chip is speed. Without the abstraction layer of software on top of the operating system on top of machine code on top of a general processor, you can perform a task much more efficiently.

The drawback is a lack of flexibility, because an ASIC chip cannot be reprogrammed. However, because IP functions don't change, those tasks can be allocated to an ASIC while higher functions — such as deciding which server to send a particular packet to — can be done on a general processor.

If the history of Layer 3 routers is any indication, hardware-based products will probably prevail in the long run. In the early days of routing, routers were servers with additional code to perform routing functions. The levels of traffic did not necessitate anything supplementary. As traffic levels increased, solutions were needed to handle higher packets per second and address the limitations of software-based network functions and the limited I/O available on a server. IP functions were burned into ASIC chips, and the modern router was born. While a rudimentary operating system (such as Cisco's IOS) handles the routing protocols and underlying algorithms, a chip handles IP functions at a much faster rate than an operating system could. It's a simple matter of computer science: The fewer layers of abstraction, the more efficient the operations are, creating greater speed and capacity.

On a competitive level, server-based load balancers are sprouting up all the time, and the server-based segment of the market will most likely reach a saturation point. There are even several Linux-based freeware load-balancing projects in development (www.linas.org/linux/load.html). Although current Web site traffic levels generally do not hit the performance wall of server-based load balancers, it is only a matter of time before they do.

Given all these factors, switch vendors seem to be the perfect arena for the next generation of load balancers. Alteon Websystems, Foundry Networks and ArrowPoint Communications offer load-balancing switches, and Extreme Networks is rolling out load-balancing functionality. The advantages of these devices are they are built with ASIC chips and backplanes capable of handling multiple gigabytes of bandwidth.

Layer 5 load balancing, also known as URL parsing, is fast becoming a standard in load-balancing products. Layer 5 load balancing differs from Layer 4 in that Layer 5 can differentiate based on the URL rather than just the IP address and port number. Currently, Alteon, ArrowPoint, Foundry and F5 Networks offer Layer 5 features.

The latest wrinkle

Firewall load balancing is a new product category. Many firewalls run on a server platform, so they suffer the same bandwidth limitations as their server-based, load-balancing counterparts. One way to overcome those limitations is to distribute the load among several firewalls or groups of firewalls. Alteon and Foundry offer this feature, and other vendors will most likely follow suit.

Overall, the Layer 4 load-balancing industry is off to a strong start, but there's still a long way to go. Eventually, code releases will stabilize and the technology will enjoy a greater degree of reliability. Layer 4/Layer 5 load balancing is and will continue to be an integral part of the modern Web infrastructure, and new, creative ways to implement load balancing will be developed.

Bourke is a senior performance engineer with GlobalCenter, Inc. He can be reached at tonyb@globalcenter.net.

Layer 4/5 load balancing in a nutshell

Layer 4: Takes the traffic in on a certain IP address and port number and distributes that traffic to any number of machines by rewriting the packet on its way in and out of the load balancer.

Layer 5: Takes Layer 4 load balancing one step further. Not only can you load balance traffic to a URL such as http://www.foo.com, but you can also direct traffic based on the full URL, such as http://www.foo.com/sales or http://www.foo.com/support. You can deploy a farm of servers that handles, say, home pages, and another that handles CGI-BIN requests:

http://www.foo.com/cgi-bin/ ‡ Server Group 1

http://www.foo.com/home/ ‡ Server Group 2

The advantages of this type of scenario are obvious. It enables you to highly specialize a group of servers, without sending traffic to separate URLs.

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ONE MAN'S QUEST

FOR A LOAD-BALANCING PRODUCT

BY ERIC BLUE

MICHAEL A. SCHWARTZ/MPG

Recently, I led a team charged with selecting a load-balancing product for my company, a major player in the business-to-business e-commerce world.

Our network consisted of more than 500 Web servers, mostly Sun Solaris boxes and a few Windows NT machines as well. Our team spent nearly eight months on the project. This is our story.

Our first step was to make a list of required features. This is the most important step in picking a product, as this list will determine which products to consider and which to eliminate. Our list was fairly demanding, but we wanted to get the biggest bang for our buck. These were our requirements:

Features list

- Robust load-balancing algorithms.
- Global load-balancing capabilities.
- High availability.
- Reporting and notification features.
- Load balancing of HTTP and FTP connections.
- Reliability.
- Multiple protocol support.
- 300-plus virtual servers supported.
- Dynamic routing capabilities.
- Network address translation capabilities.
- SNMP support.
- Minimal installation disruptions.
- Easy administration.
- Security features.

We searched the Internet, browsed through newsgroups and came up with seven products. Using our list of features, we immediately narrowed our list to three: F5 Networks' BigIP, Radware's WSD Pro and Resonate's Central Dispatch/Global Dispatch.

Our next step was to invite each of the three vendors in house for a technical meeting. We scheduled one vendor per week so we would have time to digest the information between meetings. This gave us an opportunity to meet each vendor face to face and provided an impression of the companies' professionalism and technical capabilities.

We asked each vendor to describe its product in detail against each item on our features list. We were particularly interested in their responses to our setup and implementation criteria.

Most load-balancing products require that you renumber the IP addresses of all servers to map the advertised IP address to the virtual IP address of the Web server. In a 24-7 production environment, it's important to minimize server downtime and, thereby, business interruption.

From these meetings, we eliminated Resonate from our list because some of the functionality we needed wasn't there.

The next step was to contact users of the two remaining products. We asked them to reference the following:

- How long have you used this product?
- What other products did you consider?
- Describe the implementation.
- How reliable has the product proven to be?
- How helpful has the vendor been with problems, questions and concerns?
- Have you experienced any surprises? Are there any bugs or shortcomings?
- Would you recommend this product?
- How long does the product stay online without failing?
- What level of administration is required?
- How much traffic does the product handle?

Our two finalists offered different ways of accomplishing their goals.

At the time we reviewed it, BigIP ran on a BSDi box. The product had many features we liked, but we were disappointed that it depended on a hard drive and the Unix operating system.

We believed a router-like product would probably be more stable in the long run. We called several end users of both products. Reports of uptimes confirmed our position.

Radware's offering has an architecture similar to a router, which was appealing. We also liked the multiple interfaces that allowed different implementations on our network and the robust load-balancing features. It was the only product that met all our criteria.

At that point, we brought a pair of boxes in on a trial basis. We built a replica of our network to serve as a test environment. We included the key elements of our production environment, firewalls, switches, routers and several Web servers.

The initial setup was very straightforward, taking only about 20 minutes. Web farms were easy to set up and administer. We liked the smooth failover.

We discovered a few problems in our testing period, but they were fixed with the help of Radware. The first issue we encountered was with source addressing from Sun's Quad Fast Ethernet cards. This problem was more of a Sun issue and was easily solved.

Overall, our final choice has proved to be stable, and we are happy with our decision.

One thing to keep in mind is that your network has to be completely stable before implementing any load-balancing product. Network, Domain Name System and Web server problems will only be magnified with a load-balancing product in place.

The entire process from start to finish took almost eight months. In the end, we picked a product that fit our needs and performed well. The key to picking the right product is defining your needs, researching and testing, testing, testing.

Blue is a network engineer. He can be reached at bluez@mindspring.com.

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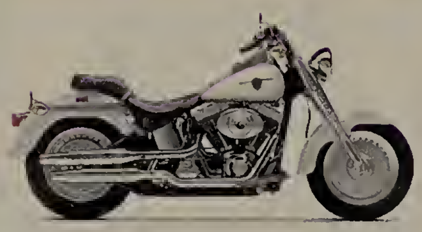

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NetworkWorld REVIEW

DNS/DHCP tools

Freedom from IP address overload

Lucent's QIP Enterprise is the best tool for ending your IP addressing nightmare.

BY BARRY NANCE, NETWORK WORLD TEST ALLIANCE

Not so long ago, network managers would assign and manage IP addresses by manually updating tab-delimited HOSTS text files of static addresses and then distribute the resulting files throughout the company. Network administrators would put copies of the files in the appropriate directories for each server and each client. Many of these same companies added to the paperwork hell by mandating the manual assignment of a locally administered address for each network adapter, which overrode the burned-in network adapter ID. The resulting workload was a millstone around network administrators' necks. Major hiring efforts and acquisitions of other companies crushed the administrators, whose lives became a horror show overnight (and over weekends).

Because no one could think of a good reason for using them, most companies have abandoned the assignment of locally administered network adapter addresses. The advent of BOOTP alleviated some of the IP address management burden. However, requests for comment for Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) hold the most promise for network administrators who want their lives back. Tools that automatically assign IP addresses and offer easy administration of TCP/IP protocol stack configurations are readily available and mature. Not only do they save network administrators time and effort, but these products also eliminate duplicate IP addresses on networks and frugally dole out IP addresses from dynamic ranges. Typically costing less than $5 per node, the tools are not very expensive.

Lucent

QIP Enterprise 5.0

This is a serious and productive network utility, especially for enterprise-size networks. Its scalability, excellent performance and useful features make it the best DNS and DHCP tool.

To help you find the best DNS/DHCP tool, we invited six vendors to submit their IP address management products. Cisco declined our invitation to test its Network Registrar product because it is between product versions. We asked that the tools support the DNS and DHCP specifications, be able to assign IP addresses across multiple routed subnet domains, track and report on address assignments, and work in a heterogeneous platform environment (see "How we did it," page 72).

We received and tested five products: Lucent's QIP Enterprise 5.0 (Service Pack 2 with Registration Manager, Provisioning Manager, Services Manager and Audit Manager optional components); two Network TeleSystems' Shadow IPserver S50 network appliances (one primary, one secondary) and Shadow IPserver software (IPmanager, IPcentral and IPserver Console); Process Software's IP AddressWorks 2.0; Nortel Networks' NetID 4.1.5; and Check Point Software's Meta IP 4.1 (Service Pack 3). We also compared these products to Novell's NetWare 5.1 network operating system (10-user version) and Microsoft's Windows 2000 Server operating system, which offer DNS and DHCP services as part of the operating system.

Our Blue Ribbon Award goes to Lucent's QIP Enterprise, which proved to be a serious and productive network utility, especially for enterprise-size networks. Its scalability, excellent performance and useful features make it the best DHCP and DNS tool.

We found the user-to-address mapping of Check Point's Meta IP worth mentioning as a great time saver. Network TeleSystems' Shadow IPserver and Meta IP offered the best-designed user interfaces, and the built-in DHCP and DNS functions of NetWare and Win 2000 are useful for small and mid-

NetResults

QIP Enterprise 5.0

RATING: 8.0 COMPANY: Lucent (888) 683 2254, http://qip.lucent.com **COST:** From $1.50 to $5 per node, minimum $10,000 for 2,000 nodes. **PROS:** Scales well; issues IP addresses quickly. **CONS:** Puts user classification workload and responsibility on each user's shoulders.

NetID 4.1.5

RATING: 7.05 COMPANY: Nortel Networks, (800) 822 9638, www.nortelnetworks.com. **COST:** Starts at $14,000. **PROS:** Highly fault tolerant; migration path from static to dynamic addresses is well done. **CONS:** Should include Sybase or Oracle relational database; needs a better method of associating individual users with IP addresses.

Shadow IPserver S50 and IPserver software

RATING: 6.95 COMPANY: Network TeleSystems, (408) 523 8100, www.nts.com. **COST:** From $16,550 to $45,000. **PROS:** Excellent Web based user interface; good performance; fault tolerant. **CONS:** Needs an LDAP or relational data store for querying and reporting.

Meta IP 4.1

RATING: 6.90 COMPANY: Check Point Software, (206) 674 3700, www.metainfo.com. **COST:** Standard edition is $445 for 100 nodes, Enterprise edition starts at $9,995 for 1,000 nodes. **PROS:** Easy to use Web based interface; mapping of users to IP addresses via logon account information is a great time saver. **CONS:** Not scalable; needs an interface to a relational database for querying and reporting.

IP AddressWorks 2.0

RATING: 5.85 COMPANY: Process Software, (800) 722 7770, www.process.com. **COST:** From $2 to $5 per node. **PROS:** Simple, uncluttered user interface with drag and drop features. **CONS:** Not scalable; needs an interface to a relational database for querying and reporting.

NetWare 5.1 (DNS/DHCP features)

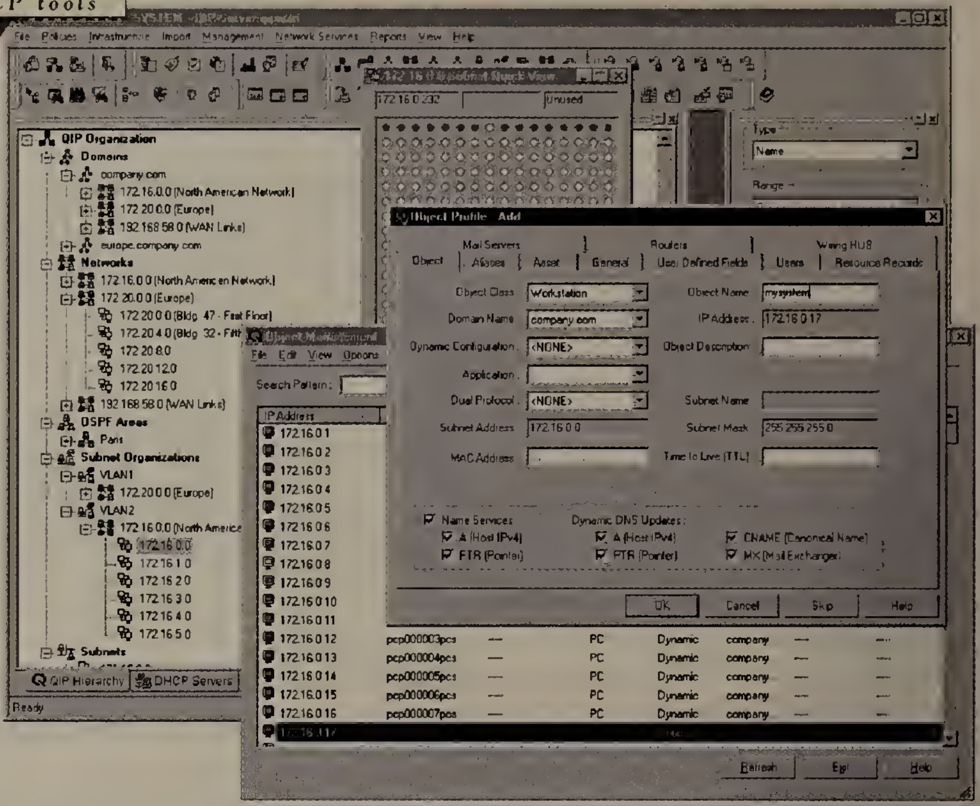
RATING: 5.20 COMPANY: Novell (800) 453 1267, www.novell.com **COST:** Starts at $1,345 for five users. **PROS:** DNS/DHCP services are a natural extension of NDS. **CONS:** Has some bugs; NetWare DNS/DHCP only available as part of the entire NetWare file server product.

Windows 2000 Server (DNS/DHCP features)

RATING: 4.45 COMPANY: Microsoft, (800) 426 9400, www.microsoft.com. **COST:** From $1,199 for 10 users. **PROS:** DNS/DHCP services are a natural extension of Active Directory. **CONS:** Immature; lacks query and reporting tools.

	Performance 30%	Administration 25%	Features 25%	Scalability 5%	Protocols 5%	Installation 5%	Documentation 5%	Total score
QIP Enterprise	9	7	8	9	8	6	8	8.00
NetID	7	7	7	7	8	6	8	7.05
Shadow IPserver	7	7	7	7	5	7	8	6.95
Meta IP	6	8	7	5	8	6	8	6.90
IP AddressWorks	5	7	5	5	8	6	8	5.85
NetWare 5.1	4	7	5	5	5	5	5	5.20
Windows 2000	4	4	5	5	5	5	5	4.45

Individual category scores are based on a scale of 1 to 10. **Percentages** are the weight given each category in determining the **total score.**



QIP Enterprise's Object Profile window has a range of criteria for categorizing IP address assignment clients.

size businesses that already use Novell Directory Services (NDS) or Microsoft's Active Directory to keep track of network resources.

Name that node

QIP Enterprise impressed us with its ability to handle large volumes of IP addresses and assign them rapidly. It let us easily spread the workload across multiple QIP Enterprise servers, and Lucent's software interoperated well with other vendors' DHCP and DNS implementations. QIP Enterprise's DNS server supports the Internet Software Consortium's (ISC) Berkeley Internet Name Domain (BIND) Versions 4.9 and 8, with extensions. Its DHCP server functioned perfectly, as either primary or secondary, when we ran it alongside the other products' DHCP servers.

QIP Enterprise's multithreaded design, which contributes to its fast performance, was apparent when we inspected it via NT Server's Performance Monitor. In our reliability tests, QIP Enterprise ensured that IP address leases weren't orphaned or reassigned. It sent lease information updates to other primary or secondary DNS servers and recorded the address assignments in its central relational database for audit, reporting and recovery purposes.

QIP Enterprise's approach to incremental zone transfers is unique and highly effective. Eschewing RFC 1995's documented process as cumbersome and unreliable, Lucent's programmers designed a proprietary BIND extension that uses Dynamic DNS to accomplish the zone transfer, and keep master and slave servers synchronized. QIP Enterprise periodically performs full zone transfers as a backup mechanism.

In our lab, the two Shadow IPserver's S50 network devices acted in tandem to provide highly reliable redundant primary and secondary DNS and DHCP services. Shadow IPserver was nearly as quick as QIP Enterprise in doling out IP addresses, and its rich feature set is evidence that network administrators helped design the product. Shadow IPserver's IPcentral component let us define policies for network configuration and access, automatically reconciled and handled legacy static address assignments within our DHCP environment and made quick work of discovering the elements of our existing IP network.

Not as fast as QIP Enterprise and Shadow IPserver but with plenty of features, Nortel's NetID was highly fault-tolerant in our tests. When we tested its reliability by disconnecting WAN links and stopping its database, NetID's individual primary and secondary components continued to function independently. The servers also emitted alarms that we viewed through the NetID Management Console. The Windows NT version of NetID we tested supports BIND 8.1.1, and Nortel says its Unix version supports BIND 8.1.2. Like QIP Enterprise, NetID distributed DHCP address assignments to other NetID DNS servers as well as the NetID relational database (Sybase or Oracle).

From a central management platform, NetID manages static and dynamic addresses. It also contains special support for companies that want to migrate from static to dynamic addressing. By allowing dynamic address ranges to overlap static addresses, NetID helps administrators transition to DHCP on a subnet-by-subnet basis.

Despite its name, Check Point's Meta IP isn't yet ready to assume the IP address management chores of a large organization. Although Meta IP's DNS is a direct port of BIND 8.2.2 (the ISC's reference implementation of DNS), address assignment performance fell far short of QIP Enterprise, Shadow IPserver and NetID. However, Meta IP did integrate openly and seamlessly with the other products' DNS/DHCP servers in the lab, and Check Point extended the BIND reference code to replicate all lease information between primary and secondary DHCP servers.

Check Point markets two configurations of Meta IP: Meta IP Standard and Meta IP Enterprise. The Standard edition can manage only up to 1,000 dynamically assigned addresses, while the Enterprise edition has no self-imposed limits. Both editions offer what Check Point terms user-to-address mapping, a highly useful function that detects logons and equates logon account IDs with assigned IP addresses. Both also integrate with Check Point's FireWall-1 product to enforce security as they assign IP addresses and track names in a firewalled environment.

Process Software's IP AddressWorks, like Meta IP, is a highly standards-compliant implementation of DNS and DHCP. IP AddressWorks was quicker in our tests at assigning addresses than Meta IP, but still slower than QIP Enterprise, Shadow IPserver and NetID. Its DHCP Safe Failover feature did a superior job of handling server failures. IP AddressWorks didn't skip a beat when we disconnected DHCP servers from different subnets in the lab. However, it lacks the ability to define and group clients in as many ways as QIP Enterprise and NetID.

NetWare's DHCP and DNS functions are NetWare Loadable Modules (NLM) that use NDS to store and retrieve IP address information. If you already have a working live

Continued on page 70

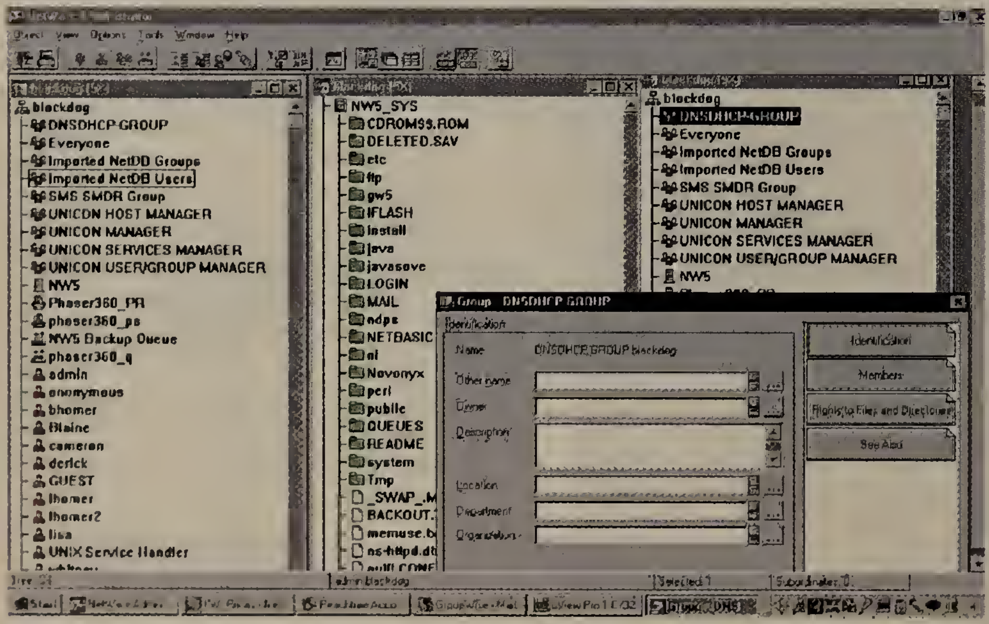
Speedy delivery

To test the programs' performance, we ran six instances, one on each subnet, of a C++ program that requested a total of 50,000 IP addresses via DHCP. We also configured QIP Enterprise and NetID products to use Oracle's database.

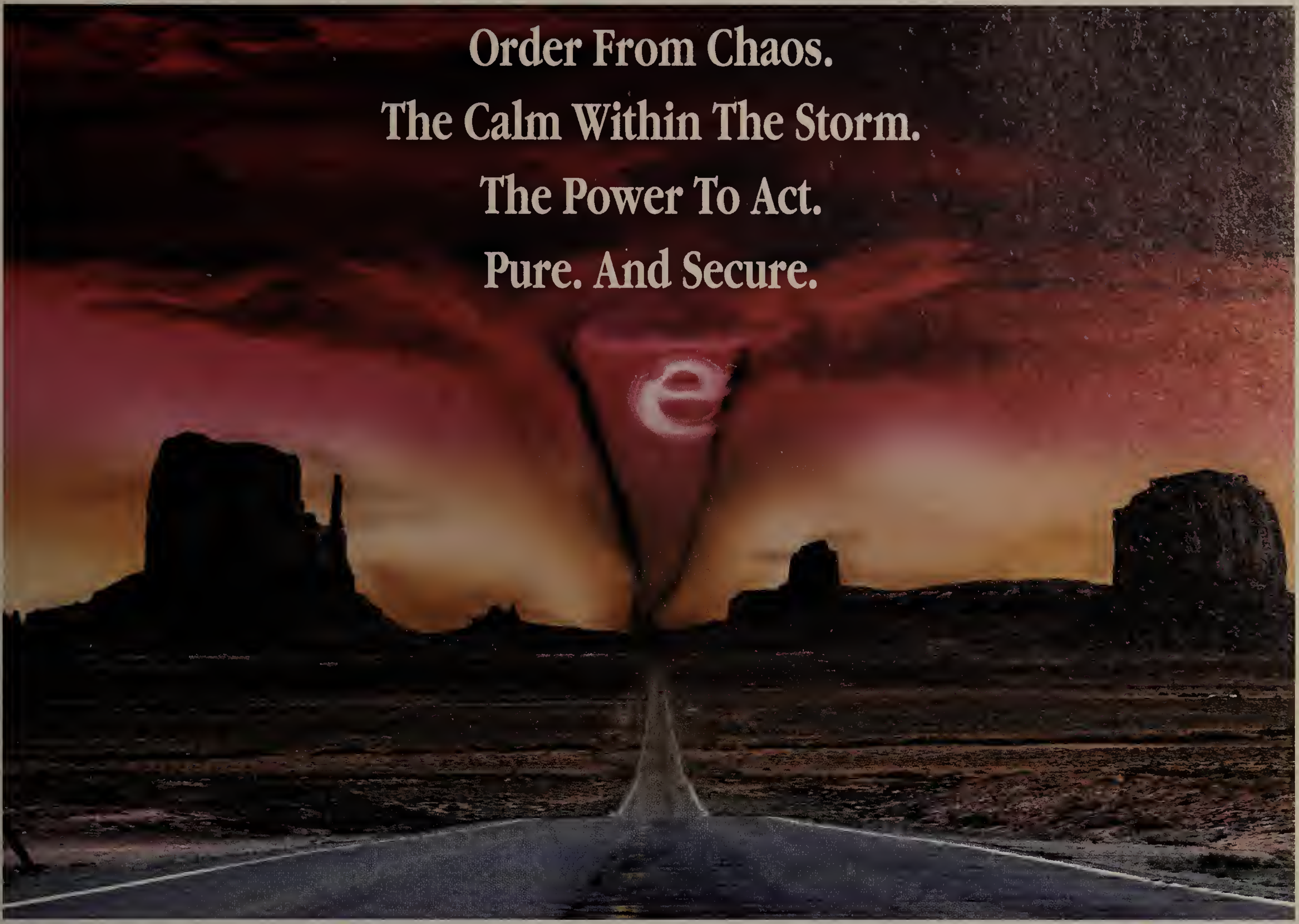
Product	Elapsed seconds	Leases per second*
QIP Enterprise	131	382
Shadow IPserver	144	347
NetID	146	342
IP AddressWorks	157	318
Meta IP	161	311
NetWare**	205	244
Windows 2000 Server**	212	236

* 50,000 divided by elapsed seconds.

** NetWare and Windows 2000 Server had file server and Web servers running during the test.



Setting up DNS and DHCP criteria using the contents of an existing NDS tree is easy with the NetWare Administrator utility.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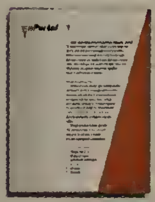

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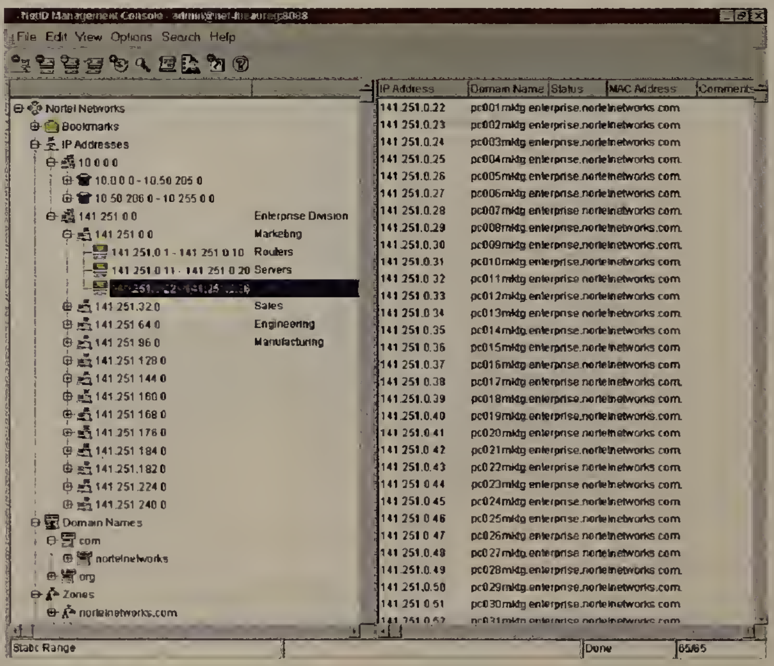
NDS tree, you'll find Novell's DHCP and DNS a natural extension to your directory. However, you wouldn't want to introduce NetWare into your company just to manage your IP addresses.

Because we used NetWare in its usual role as file server at the same time we forced it to assign IP addresses, NetWare was slower than all except Win 2000 at responding to DHCP-DISCOVER messages. As a result of some programming bugs (invalid pointers) we encountered, the DHCP/DNS NLMs also caused a few protection faults. These faults crashed our NetWare servers. If you decide to use NetWare's DNS/DHCP feature and you have multiple NetWare machines, we recommend putting the NLMs on your least critical and least busy NetWare servers.

Just as NetWare's DHCP and DNS rely on Novell's NDS technology, Win 2000 address management services rely on Microsoft's Active Directory technology. If you're at a small to midsize organization that decided to use Active Directory as the central inventory tool for network resources, Win 2000's DHCP and DNS functions may be right for you. We were delighted that Active Directory uses a multimaster replication engine, which meant we didn't have to maintain separate replication network pathways for DNS. We also liked Win 2000's multicast address allocation feature. However, on a Win 2000 server that we kept busy as a file server and Web server, the Active Directory-based DHCP and DNS in Win 2000 performed much slower than all other products reviewed. Moreover, Active Directory is new technology from Microsoft, and the company is still adding features.

User administration

Whether it's a Class A, B or C address, an IP address should be relevant to the computer or network device to which it's assigned. A DHCP server that randomly assigns addresses is only slightly better than distributing a manually updated HOSTS file. Fortunately, these DNS/DHCP products offered many ways to associate an IP address with specific users, devices and subnets. For example, Meta IP's creative use of logon account information made it the most productive tool for classifying users, while Lucent's QIP Enterprise puts the onus on each user to create correct IP address relationships. That scheme saves time for network administrators but opens up the possibility of confusion and error.


NetID Management Console - admin@net-[illegible]
File Edit View Options Search Help

- Nortel Networks
  - Bookmarks
  - IP Addresses
    - 10.0.0.0
      - 10.0.0.0 - 10.50.205.0
      - 10.50.206.0 - 10.255.0.0
    - 141.251.0.0 Enterprise Division
      - 141.251.0.0 Marketing
        - 141.251.0.1 - 141.251.0.10 Routers
        - 141.251.0.11 - 141.251.0.20 Servers
        - 141.251.0.22 - 141.251.[illegible]
      - 141.251.32.0 Sales
      - 141.251.64.0 Engineering
      - 141.251.96.0 Manufacturing
      - 141.251.128.0
      - 141.251.144.0
      - 141.251.160.0
      - 141.251.168.0
      - 141.251.176.0
      - 141.251.184.0
      - 141.251.182.0
      - 141.251.224.0
      - 141.251.240.0
  - Domain Names
    - com
      - nortelnetworks
    - org
  - Zones
    - nortelnetworks.com

IP Address	Domain Name	Status	MAC Address	Comments
141.251.0.22	pc001mktg.enterprise.nortelnetworks.com			
141.251.0.23	pc002mktg.enterprise.nortelnetworks.com			
141.251.0.24	pc003mktg.enterprise.nortelnetworks.com			
141.251.0.25	pc004mktg.enterprise.nortelnetworks.com			
141.251.0.26	pc005mktg.enterprise.nortelnetworks.com			
141.251.0.27	pc006mktg.enterprise.nortelnetworks.com			
141.251.0.28	pc007mktg.enterprise.nortelnetworks.com			
141.251.0.29	pc008mktg.enterprise.nortelnetworks.com			
141.251.0.30	pc009mktg.enterprise.nortelnetworks.com			
141.251.0.31	pc010mktg.enterprise.nortelnetworks.com			
141.251.0.32	pc011mktg.enterprise.nortelnetworks.com			
141.251.0.33	pc012mktg.enterprise.nortelnetworks.com			
141.251.0.34	pc013mktg.enterprise.nortelnetworks.com			
141.251.0.35	pc014mktg.enterprise.nortelnetworks.com			
141.251.0.36	pc015mktg.enterprise.nortelnetworks.com			
141.251.0.37	pc016mktg.enterprise.nortelnetworks.com			
141.251.0.38	pc017mktg.enterprise.nortelnetworks.com			
141.251.0.39	pc018mktg.enterprise.nortelnetworks.com			
141.251.0.40	pc019mktg.enterprise.nortelnetworks.com			
141.251.0.41	pc020mktg.enterprise.nortelnetworks.com			
141.251.0.42	pc021mktg.enterprise.nortelnetworks.com			
141.251.0.43	pc022mktg.enterprise.nortelnetworks.com			
141.251.0.44	pc023mktg.enterprise.nortelnetworks.com			
141.251.0.45	pc024mktg.enterprise.nortelnetworks.com			
141.251.0.46	pc025mktg.enterprise.nortelnetworks.com			
141.251.0.47	pc026mktg.enterprise.nortelnetworks.com			
141.251.0.48	pc027mktg.enterprise.nortelnetworks.com			
141.251.0.49	pc028mktg.enterprise.nortelnetworks.com			
141.251.0.50	pc029mktg.enterprise.nortelnetworks.com			
141.251.0.51	pc030mktg.enterprise.nortelnetworks.com			

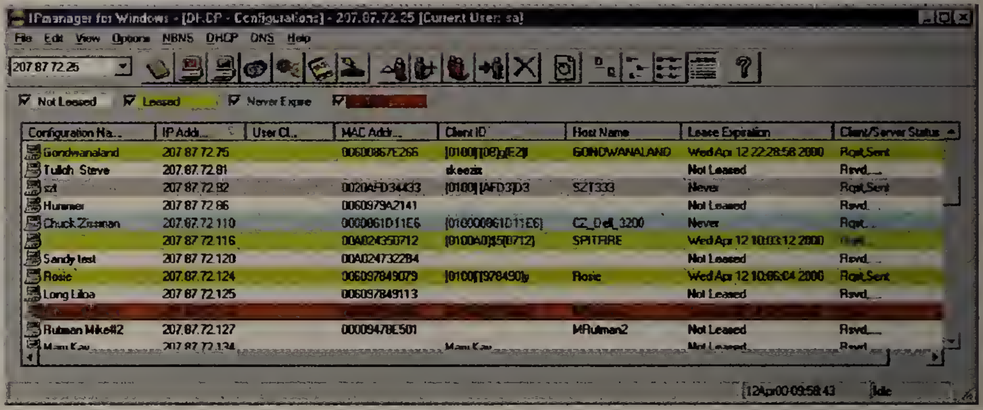
Static Range | Done | 65/65

The NetID Management Console has a Windows Explorer-like interface for viewing and changing IP address assignments.

Network TeleSystems' Shadow IPserver takes a policy-based approach to classifying users for IP address assignment. Using rules and criteria set up by a network administrator, Shadow IPserver groups users by DHCP User Class (such as marketing, engineering and accounting), media access control (MAC) address and the rarely used DHCP Vendor Class. Unfortunately, in contrast to QIP Enterprise's and Meta IP's approaches, Shadow IPserver makes the hapless network administrator assign each user to a User Class (one by one), take note of the user's MAC address or find a TCP/IP protocol stack that supports DHCP Vendor Class. Only its excellent user interface saved Shadow IPserver from a lower score for administration in our scorecard.

Meta IP's user-to-address mapping technology made our jobs as IP address administrators a snap. In contrast to specifying users' MAC addresses or subnet IDs, user-to-address mapping is clearly a superior method of identifying IP clients. Using Meta IP, we mapped dynamically-assigned IP addresses to clients based on logon account ID, logon time and MAC address. By automatically correlating file server logons with dynamic IP address leases, Meta IP let us painlessly track address assignments by user rather than by machine address. Meta IP stored the result in its database for reporting purposes and monitoring network usage.

With its complementary Registration Manager option, QIP Enterprise can distinguish requests for IP addresses by MAC address (for example, DHCP Client ID) as well as DHCP Vendor Class. By default, QIP Enterprise allots addresses from a general address pool. When the client then visits Registration Manager's intranet Web site to identify himself or herself in a manner designated by the network administrator, QIP Enterprise associates the assigned IP address with that client's MAC address. QIP Enterprise responds to subsequent DHCP-DISCOVER requests from that MAC address with the registered IP address. A network administrator can change QIP Enterprise's registration for that client to allocate an address based on group membership in an alternate or preferred subnet. QIP Enterprise clients can belong to a single group or multiple groups. Of course, replacing the user's network adapter or entire desktop computer when hardware problems occur forces that user back through the registration process.


IPmanager for Windows - [DHCP - Configurations] - 207.87.72.25 [Current User: sa]
File Edit View Options NBNS DHCP DNS Help
207.87.72.25

☑ Not Leased ☑ Leased ☑ Never Expire ☑

Configuration Na...	IP Addr...	User Cl...	MAC Addr...	Client ID	Host Name	Lease Expiration	Client/Server Status
Gondwanaland	207.87.72.75		00600867E266	[0100][08]g[E2]	GONDWANALAND	Wed Apr 12 22:28:58 2000	Rqst Sent
Tulloh Steve	207.87.72.81			skeezix		Not Leased	Rsvd...
szt	207.87.72.82		0020AFD34433	[0100][AFD3]D3	SZT333	Never	Rqst Sent
Hummer	207.87.72.86		0060979A2141			Not Leased	Rsvd...
Chuck Zissman	207.87.72.110		0000861D11E6	[01000861D11E6]	CZ_Dell_3200	Never	Rqst...
	207.87.72.116		00A024350712	[0100A0][35][0712]	SPITFIRE	Wed Apr 12 10:03:12 2000	[illegible]
Sandy test	207.87.72.120		00A024732284			Not Leased	Rsvd...
Rosie	207.87.72.124		006097849079	[0100][978490]y	Rosie	Wed Apr 12 10:06:04 2000	Rqst Sent
Long Liba	207.87.72.125		006097849113			Not Leased	Rsvd...
[illegible]							
Rutman Mike#2	207.87.72.127		00009478E501		MRutman2	Not Leased	Rsvd...
Mam Kau	207.87.72.134			Mam Kau		Not Leased	Rsvd

12Apr00 09:58:43 | Idle

Shadow IPserver's IPmanager highlights expired and leased addresses in different colors.

The Subnet Organizer component within QIP Enterprise handles true Variable-Length Subnet Masking (VLSM). This let us easily join or split subnets with other noncontiguous subnets. The component also provides a customizable management interface for delegating an IP address space to specific administrators or groups of administrators across domains, networks and subnets. QIP Enterprise transparently and quickly passed the appropriate DHCP and DNS inheritances to the newly configured subnets we created.

Nortel's NetID also supports VLSM IP address architectures. Partitioning or joining subnets with NetID was even easier than QIP Enterprise, and we liked how NetID automatically calculated the subnet mask values. However, NetID needs a better approach to identifying users for IP address assignment, one that saves network administrators from the tedious chore of manually placing each user in a group or logical subnet.

Process Software's IP AddressWorks can import user ID and address assignment information from a variety of sources, including spreadsheets, Address Resolution Protocol caches and other DNS servers. Because it's slow and doesn't offer the sophisticated client categorization capability of products such as QIP Enterprise and NetID, we suggest IP AddressWorks is only appropriate for small networks whose IP address population undergoes few changes.

If you're a NetWare 5.1 customer with an existing NDS tree, the additional work of classifying users for IP address assignment is trivial. Your NDS tree already contains user IDs, MAC addresses, user groups and other criteria. Similarly, if you've installed and set up Active Directory on a Win 2000 server, setting up address classification schemes for users is simply a drag-and-drop affair.

Storing addresses

One of the key factors that determines the scalability of these products is how they store address pools and user classification data. Quick, nimble storage mechanisms with several customizable reporting options and greater capacity for large client populations can handle a wider range of IP address assignment situations.

Lucent bundles a run-time version of the Sybase Adaptive Server relational database with QIP Enterprise, and it also supports the use of Oracle 7.X or 8.X. We used both databases in the lab and found the Sybase Relational Database Management System (RDBMS) slightly faster. QIP Enterprise integrates via Lightweight Directory Access Protocol (LDAP) with directory servers, but its primary storage medium is the RDBMS. QIP Enterprise worked well with Netscape's directory product in our tests.

Continued on page 72

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Continued from page 70

Nortel's NetID works with the Sybase or Oracle relational databases but comes with neither. As with QIP Enterprise, the Sybase option (we used Adaptive Server 11.5 vs. Oracle8i) was faster. Like Lucent's product, NetID integrates with directory servers, such as Netscape's, via LDAP.

QIP Enterprise and NetID offer a greater number of report formats than the other DNS/DHCP tools, and the ability to query each product's relational database with ad hoc reporting tools is icing on the cake.

Check Point's Meta IP and Process Software's IP AddressWorks store IP address information in LDAP-accessible data stores. Network TeleSystems' Shadow IPserver internally uses a proprietary data storage mechanism, and it doesn't support LDAP or relational databases. The Meta IP, IP AddressWorks and Shadow IPserver reporting tools are barely adequate for small and midsize companies. For the requirements of an enterprise, these tools simply don't offer a sufficient variety of management views.

NetWare stores IP address information in the NDS tree as new NDS objects. Examples of these new objects include DNS/DHCP Locator, DNS Zone, DNS Resource Record Set, Subnet, Address Range and Subnet Pool. You'll need to buy a third-party report generator if you want to query the NDS tree for IP address information.

Win 2000 stores its DNS and DHCP information in the Active Directory infrastructure, for which Microsoft or a third party desperately needs to create query and reporting tools.

Managing the tools

QIP Enterprise, NetID, Meta IP and Shadow IPserver offer a Web browser-based interface. QIP Enterprise, NetID and Meta IP supply Windows (or Motif, for the Unix version) management consoles, while Shadow IPserver also provides a command-line interface. We found Shadow IPserver's and Meta IP's Web browser interfaces especially easy to use.

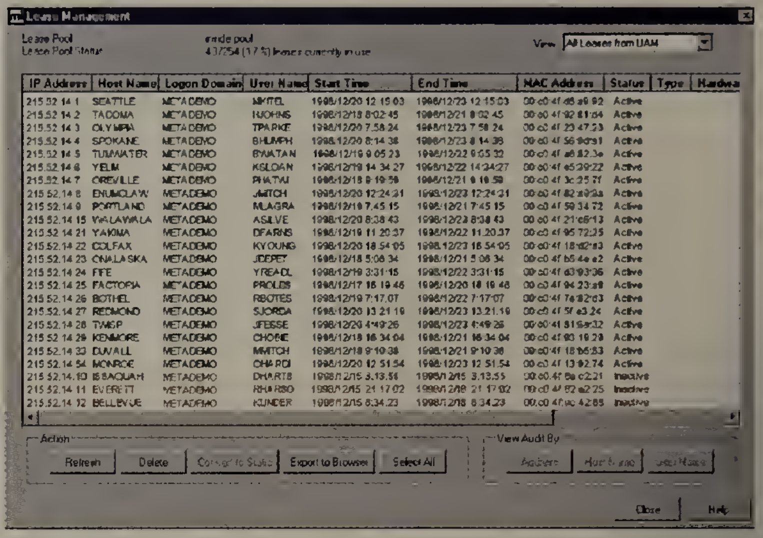
IP AddressWorks' user interface is a Win32 program that presented an uncluttered view of IP address resources and offered drag-and-drop movement of users among groups. We liked its clean, simple design.

The NetWare and Win 2000 management interfaces are Win32 programs that display expandable and collapsible tree views of IP address information along with other NDS tree or Active Directory data.

All the products' interfaces, whether Web- or Windows-based, showed DNS and DHCP servers, zones, subnets, current leases and subpools. Furthermore, QIP Enterprise, NetID and Meta IP excelled at letting a network administrator delegate tasks to assistants.

Protocols, installation and documentation

All the products conformed adequately to the existing DNS and DHCP RFCs, interoperating successfully when we used them in various combinations of primary and secondary servers. They were all easy to install. In fact, Network TeleSystems' Shadow IPserver came preloaded on its network appliance hardware — no installation needed. However, we would've liked Shadow IPserver, NetWare and Win 2000 better if they supported LDAP and Open Database Connectivity for storage purposes.



Meta IP's Lease Management windows show the MAC address and logon account ID for IP address assignment clients.

QIP Enterprise, the Shadow IPserver software, IP AddressWorks, NetID and Meta IP came with printed documentation that's easy-to-follow and adequate. Novell and Microsoft don't send printed DHCP and DNS setup instructions with NetWare and Win 2000. We had to browse the online documentation, which at times we found unclear. Alternatively, you can get a good third-party NetWare or Win 2000 book at your bookstore.

If you're still editing and distributing a departmentwide or companywide HOSTS file of static IP address assignments you maintain manually, we suggest you take a close look at Lucent's QIP Enterprise.

Nance, a software developer and consultant for 29 years, is the author of Introduction to Networking, 4th Edition *and* Client/Server LAN Programming. *His e-mail address is barryn@erols.com.*

Nance is also a member of the Network World Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing to bear years of practical experience on every review. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.

How we did it

Our test environment consisted of six routed Fast Ethernet subnet domains and a T-1 connection to our ISP. The Internet link let us perform massive zone transfers and other large-scale IP address operations, but most of our testing occurred just on our network's intranet. Throughout the subnet domains, we ran several concurrent instances of a C++ program we wrote that issued DHCP-DISCOVER messages. Some of these messages were valid requests for IP address information, but we also deliberately created many invalid requests. Our invalid situations included duplicate requests, missing DHCP-REQUEST messages and lease renewal requests at other than the usual lease half-life interval. To cause address reassignment, we forced clients to frequently join and leave the network. To test performance, we used a stopwatch to measure how quickly each Dynamic Host Configuration Protocol (DHCP) server could assign 50,000 IP addresses.

We also tested the products' handling of implied source subnet qualifier overrides to verify selection of the correct address for a particular logical network. This test helps us assess how a product behaves when you need to migrate multiple subnets on a single broadcast segment to a flat, switched network topology.

We moved clients from one subnet to another, gave unique values to the DHCP client ID field and assigned different values to the user class ID and vendor class ID DHCP parameters to see how the DHCP servers would respond. We looked at how each vendor's DHCP server handled sequences of valid and invalid DHCP-DISCOVER, DHCP-OFFER, DHCP-REQUEST and DHCP-PACK messages. We tested each DHCP server's ability to respond to a variety of different client platform's TCP/IP protocol stacks with DHCP configuration options appropriate to those platforms. The 25 client computers on our network were a mix of Windows 2000 Professional, NT Workstation 4.0, Windows 98, OS/2 Warp 4.0 and Macintosh System 8 platforms.

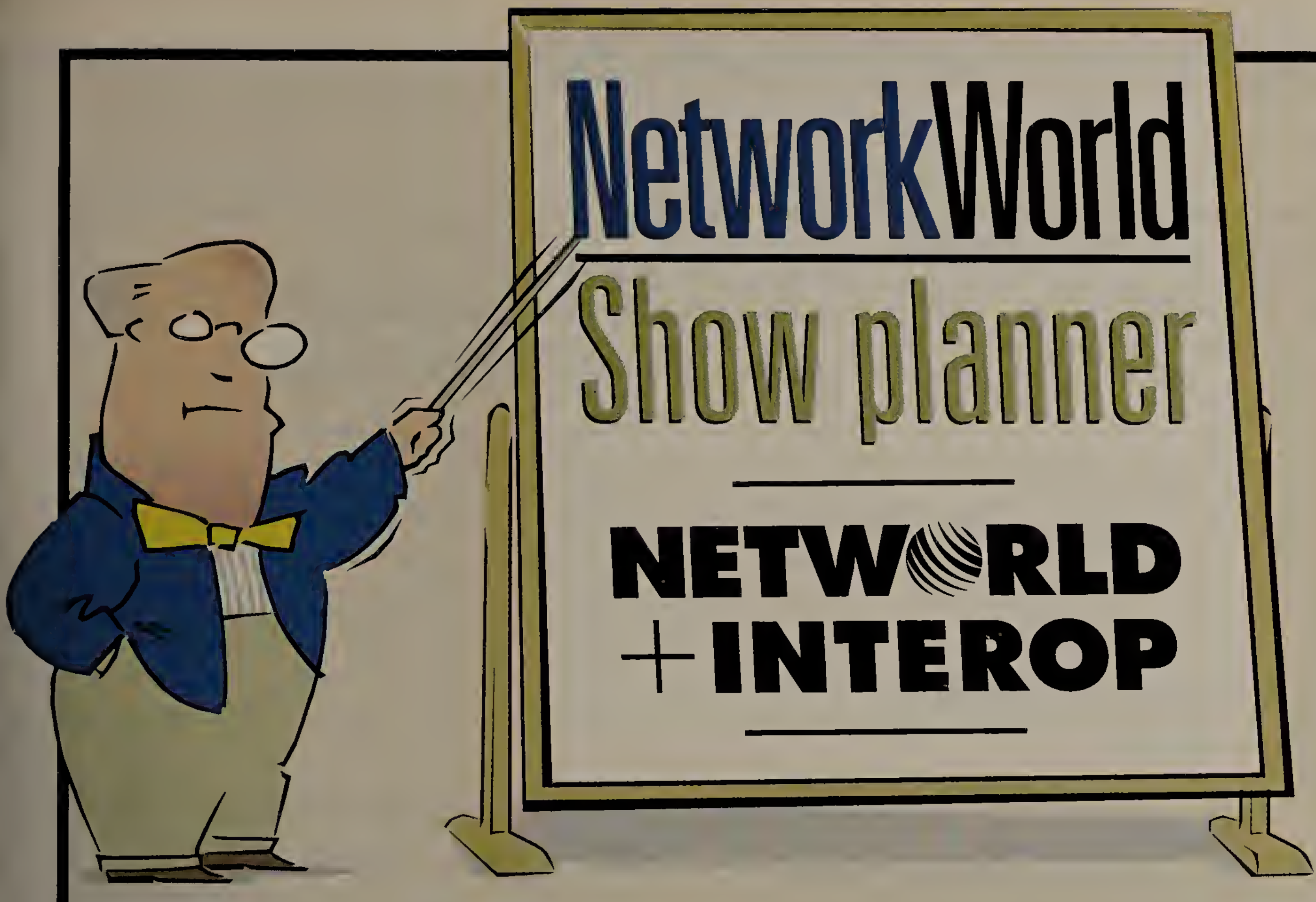
We also evaluated each product's dynamic Domain Name System functions as well as its ability to efficiently update its DNS database with names and addresses from the ISP's DNS server. We even combined these products in various ways to determine their interoperability.

We factored in the ease with which we could administer the products, centrally or remotely, paying particular attention to each vendor's address pool maintenance and network monitoring tools. We looked at each product's support for BIND 8 and DHCP Version 6; determined each product's level of security; and took into consideration what each vendor offers by way of scalability and fault tolerance.

Except for Network TeleSystems' Shadow IPserver, which is a combination hardware and software product consisting of two network appliances preloaded with the IP address management software, we ran the address management software products on three Gateway NS-8000 computers with 333-MHz Pentium II dual processors, 512M bytes of RAM and three 9G-byte SCSI RAID drives. In each case, the operating system platform was Windows NT Server 4.0 with Service Pack 5.

For reporting and querying tools, we used either the database that shipped with the product or one recommended by the vendor to store the IP address data.

Network Associates' Sniffer protocol analyzer software, running on a Dolch PAC63 computer, decoded and displayed network traffic.



NetworkWorld Show planner

NETWORLD +INTEROP

It's spring, and that means it's time for the who's who in network technology to flock to Las Vegas for NetWorld+Interop 2000. This year's show features more than 750 vendors and 800 hours of technical training and events. So if you're one of the 60,000 network professionals expected to attend, take along this handy guide to the best keynotes, sessions and events, so you can enjoy both the show and all Las Vegas has to offer. Have a great show!

Picks of the Week

Network Forensics Day

Monday, May 8, 8 a.m. to 7 p.m.

If you read *Network World*, you're obviously concerned about the health and security of your enterprise network. This all-day session will provide tips for helping to reduce bottlenecks, increase performance and keep hackers out — the very tasks you're entrusted with.

The most interesting part of the session deals with the anatomy of a network break-in and how to recognize and detect when hackers are attempting to break down the front door. With one recent survey claiming that nine out of 10 big companies and government agencies have been hacked, this session may help you stay in the 10% that haven't been invaded.

Speaking with moderator Bill Alderson, founder of the Pine Mountain Group consultancy, is a team of his top network analysts, including Jeff Trawick, Mike Pennacchi and Ray Tompkins. Alderson says this session is good for both managers and technologists.

Bill Gates keynote

Tuesday, May 9, 9 a.m. to 10 a.m.

When Bill Gates speaks, everyone listens . . . especially the Department of Justice. Gates is scheduled to give a speech titled "Creating a new Internet user experience," which will touch on the premise of always-connected users.

With the number of handhelds and other Internet-ready devices proliferating, users will be able to be connected to the Internet all the time. Gates will outline how Microsoft and its partners are driving this goal of being connected anywhere, anytime.

Highlights

Monday, May 8

9 a.m. to 5:30 p.m.

VPN DAY

Looking to implement a virtual private network (VPN) or expand an existing implementation? This all-day workshop could be for you. The session touches on various cryptography and public-key infrastructure schemes used to keep data secure as it travels across the public network. The workshop will also include case studies showing how VPN technology is being used in the real world. Speakers include Frederick Avolio of Avolio Consulting, Dave Piscitello of Core Competence and Joel Snyder of Opus One Consulting.

8:30 a.m. to 5:15 p.m.

NETWORK PROCESSOR SUMMIT

Networks are handling more traffic and different types of data every day. To help ensure quality of service and the best-possible routing, companies are building intelligent processor directly into networking equipment. Speakers include technical staff and analysts from IBM, Fearless Group, Vertex, C-Port, Vitese, Mick Group, EZchip Technologies, Agere, MMC Networks, Sitera, Maker Communications, Intel, Inverness Systems, T.sqware, Silicon Access, Sterling Research, Broadcom, Chrysalis-ITS, Extreme Packet Devices, SwitchOn Networks, Power X, Sebring Networks and Solidium.

Tuesday, May 9

10:15 a.m. to 11:15 a.m.

APPLYING THE FINISHING TOUCHES TO IP SECURITY

For IP Security (IPSec) to become a universal security standard on the Internet, enterprise networks have to be prepared. Bob Moskowitz, senior technical director at the International Computer Security Association, will speak about what has to be done technically to make IPSec a viable option for Internet security, including eliminating network address translation and integrating IPSec with strong authentication standards.

11:30 a.m. to 12:30 p.m.

PRACTICAL APPLICATIONS OF VPN TECHNOLOGIES

Virtual private networks (VPN) are a great way of extending corporate network access to remote users in a secure yet inexpensive fashion. The problem with VPN technology is that there is no one-size-fits-all implementation. Different organizations have different technical and cultural barriers to overcome. This session takes a look at how companies are implementing VPNs and how they deal with the user base. David Bovee of WatchGuard Technologies moderates the panel. Panelists include David Piscitello of Core Competence and Karl Schohl of American Telisys.

3:15 p.m. to 4:15 p.m.

DSL SERVICE PROVIDER EXECUTIVE PANEL

Digital subscriber line (DSL) technology is in a race with cable modems to become the dominant broadband service to small and midsize business. This panel discussion — led by Brett Sheppard, primary DSL analyst at TeleChoice — focuses on the trends in DSL technology and what types of service businesses can expect from their DSL providers. Panelists include Anjali Joshi of Covad Communications, Mike Calabrese of Rhythms NetConnections, Mike Borsetti of Northpoint and Jason Sew of SBC Communications.

Highlights cont'd.

Wednesday, May 10

11:30 a.m. to 12:45 p.m.

QOS: THE NETWORK SIDE

Moderated by *Network World's* Jeff Caruso, this panel takes a look at various methods for implementing quality of service in your corporate network. With the number of applications and amount of data vying for space on the network, it's important to have some mechanisms in place to ensure important traffic gets through quickly. Panelists include Todd Krautkremer of Packeteer, James Dunn of Autodesk, George Prodan of Extreme Networks and Charles Maricle of Phonoscope Communications.

11:30 a.m. to 12:30 p.m.

INTRUSION DETECTION: BEST PRACTICES

We all wish hackers had better things to do with their time than break into corporate networks. Unfortunately, this is not the case — network executives need to be on guard 24 hours a day, 365 days a year. In this discussion, Phil Cox, a consultant with SystemsExperts, talks about ways of implementing intrusion-detection systems that are effective in combating hackers and limiting the amount of time the IS staff spends chasing false alarms.

2 p.m. to 3 p.m.

WIRING FOR GIGABIT ETHERNET AND BEYOND

With super high-speed Internet access coming, companies need to have their internal network wiring up to par to support the increased bandwidth. Phil Hippensteel, vice president of training and technology at BFG Consulting, leads this session. Hippensteel will discuss the latest in wiring technology and provide tips on how to wire today's building for tomorrow's technology.

4:30 p.m. to 5:30 p.m.

BUILDING A CAMPUS NETWORK PANEL DEBATE

Building a campus network is every techie's dream and nightmare at the same time. What technologies do you use? How important is quality of service? Does voice over IP come into play? David Passmore of the Burton Group (formerly NetReference) hosts a debate to find out what the best offerings are for building a campus network. Panelists include Bruce Tolley of Cisco, Ray Hanson of Alcatel Internetworking and George Prodan of Extreme Networks.

Thursday, May 11

9:30 a.m. to 10 a.m.

THE MANAGEMENT PORTAL: A MANAGEMENT ENABLER?

Portals offer a window into the corporate world. A manager can use a portal to keep track of everything going on in a company and his or her department. Portals can offer customized views of corporate data so users can have the data that pertains to them in front of them at all times. This session looks at the various tools and technology that can be used to build management portals. The discussion is led by John McConnell of McConnell and Associates. Also participating is Jeff Thiemann, CEO of Manage.Com.

12:30 p.m. to 1:45 p.m.

WIRELESS LANS: NOW THAT THEY'RE REAL, WHAT IS THEIR STRATEGIC IMPACT?

IDC is predicting that there will be more handheld and mobile devices connecting to the Web than PCs by the end of 2002. Prices are falling and standards are coming into line, making wireless technology popular and more readily available. Speaking at the session will be Kurt Bauer of Proxim and Phil Belinger of Aironet.

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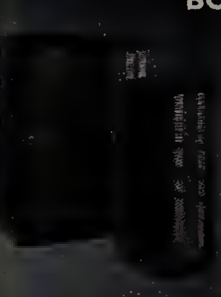

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Must See

Network World's Broadband Access Showdown

When: Tuesday, May 9, from 12:30 p.m. to 1:45 p.m.
Where: Las Vegas Convention Center

Led by *Network World's* Editorial Director John Gallant, the showdown is a presidential-style debate designed to cut through the marketing clutter and distill for attendees the most important issues of the day.

Specifically, this showdown will focus on the issues and opportunities involved in bringing high-speed access to your business. Quizzed by *Network World's* panel of experts, you'll find out how service providers aim to weave together technologies such as digital subscriber line, cable, fiber and fixed wireless to break the local-loop bottleneck choking your WAN. You'll learn which vendor is best positioned to bring your company a 21st century broadband network.

The vendor panel includes:

- J. Michael Jenner, a vice president with AT&T Data & Internet Services.
- Fred Briggs, MCI WorldCom's chief technology officer.
- Doug Carter, Nextlink's senior vice president and CTO.
- Augie Cruciotti, senior vice president of Qwest Link, Qwest's DLEC/CLEC operation.
- Jason Few, vice president of broadband communications for SBC Communications.

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The panel of experts

- Bob Brown, news editor, *Network World*
- David Rohde, senior editor, *Network World*

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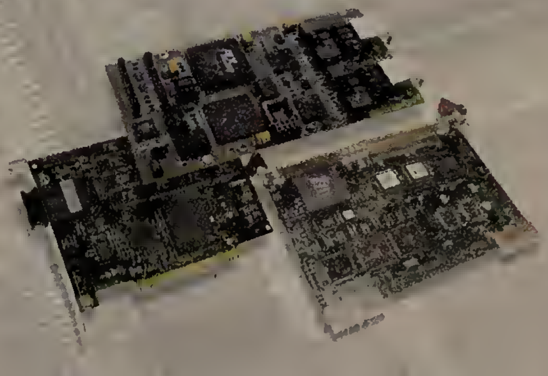

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Suited for SUCCESS

What to wear for that career-making presentation.

Let's face it. Network executives aren't known for high fashion.

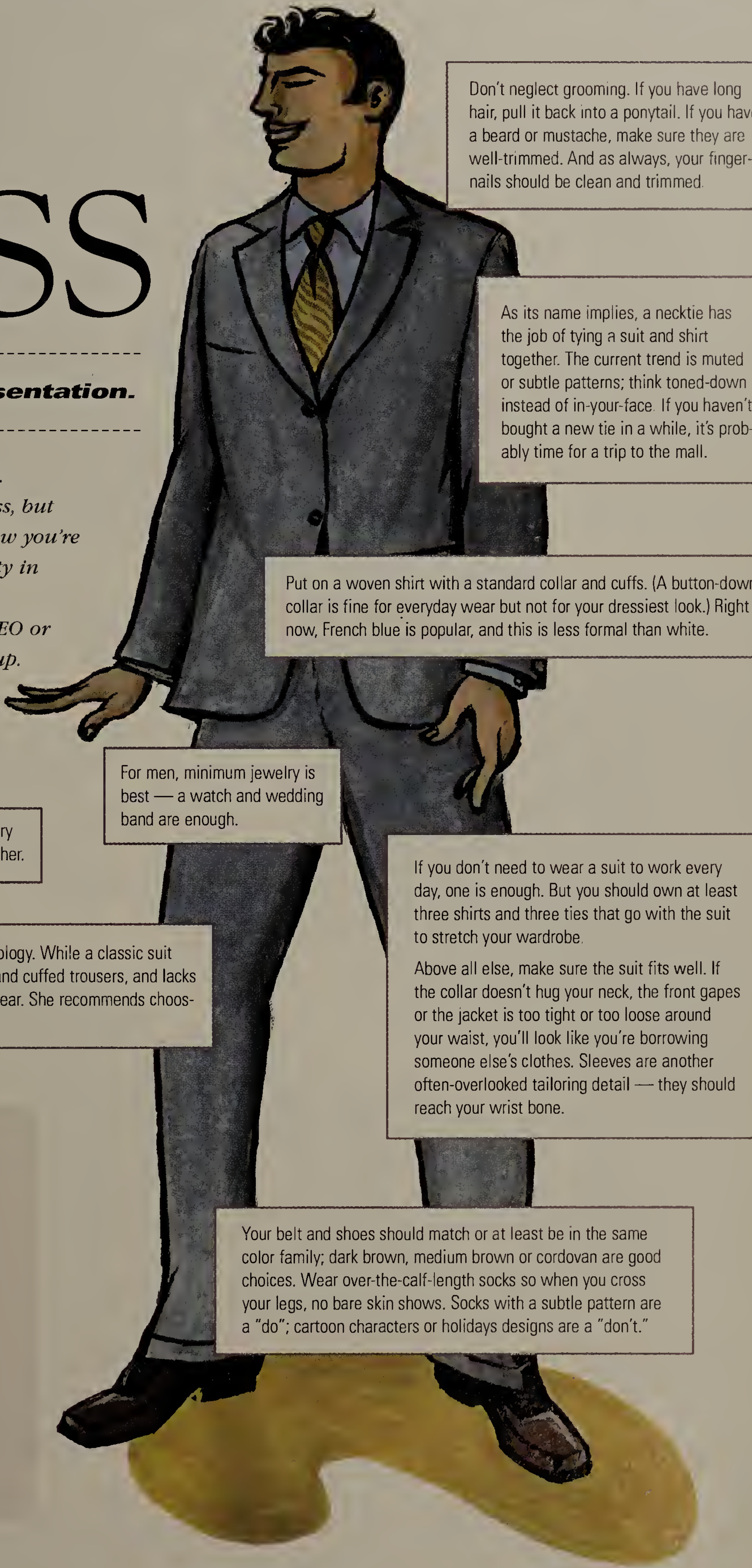
Not that there's anything wrong with the way IT types dress, but if you've ever walked the floor at NetWorld+Interop, you know you're not looking at a group of people who make fashion a priority in their busy lives.

But there are occasions — an important presentation to the CEO or executive committee, perhaps — when it wouldn't hurt to dress up.

With that in mind, Network World *asked Jean Gaffney, an image consultant in Littleton, Mass., for some pointers on what to wear to an important meeting. Here are her tips:*

Dressy clothes are generally made of fine wools, cottons and silks. They should have very little texture and not be very colorful. Look for shoes and belts made of soft, smooth leather.

You can't afford to look outdated when you're trying to promote the latest technology. While a classic suit has two buttons and is always in style, the more current suit has three buttons and cuffed trousers, and lacks a center vent. Gaffney says black isn't an appropriate color for men's business wear. She recommends choosing a medium-to-dark tone of blue, gray, taupe or olive.



Don't neglect grooming. If you have long hair, pull it back into a ponytail. If you have a beard or mustache, make sure they are well-trimmed. And as always, your fingernails should be clean and trimmed.

As its name implies, a necktie has the job of tying a suit and shirt together. The current trend is muted or subtle patterns; think toned-down instead of in-your-face. If you haven't bought a new tie in a while, it's probably time for a trip to the mall.

Put on a woven shirt with a standard collar and cuffs. (A button-down collar is fine for everyday wear but not for your dressiest look.) Right now, French blue is popular, and this is less formal than white.

For men, minimum jewelry is best — a watch and wedding band are enough.

If you don't need to wear a suit to work every day, one is enough. But you should own at least three shirts and three ties that go with the suit to stretch your wardrobe.

Above all else, make sure the suit fits well. If the collar doesn't hug your neck, the front gapes or the jacket is too tight or too loose around your waist, you'll look like you're borrowing someone else's clothes. Sleeves are another often-overlooked tailoring detail — they should reach your wrist bone.

Your belt and shoes should match or at least be in the same color family; dark brown, medium brown or cordovan are good choices. Wear over-the-calf-length socks so when you cross your legs, no bare skin shows. Socks with a subtle pattern are a "do"; cartoon characters or holidays designs are a "don't."

GERALD NELSON

Comfortably casual

Here are some guidelines for everyday office wear:

- Heavier wools, cottons and leather are appropriate materials for casual wear; textures such as knits, flannel, corduroy and grained leather are OK. Clothing can also have more pattern and color.
- Your regular work attire probably calls for a polo shirt or a long sleeve cotton shirt in a solid color, check or plaid. You may even be able to get away with more casual wear, such as a shirt without a collar.
- Khaki pants are dressier than jeans, but only if they're pressed. A belt makes casual wear more businesslike.
- The difference between casual shoes and more formal footwear is that casual ones tend to have thicker soles and look bulkier.

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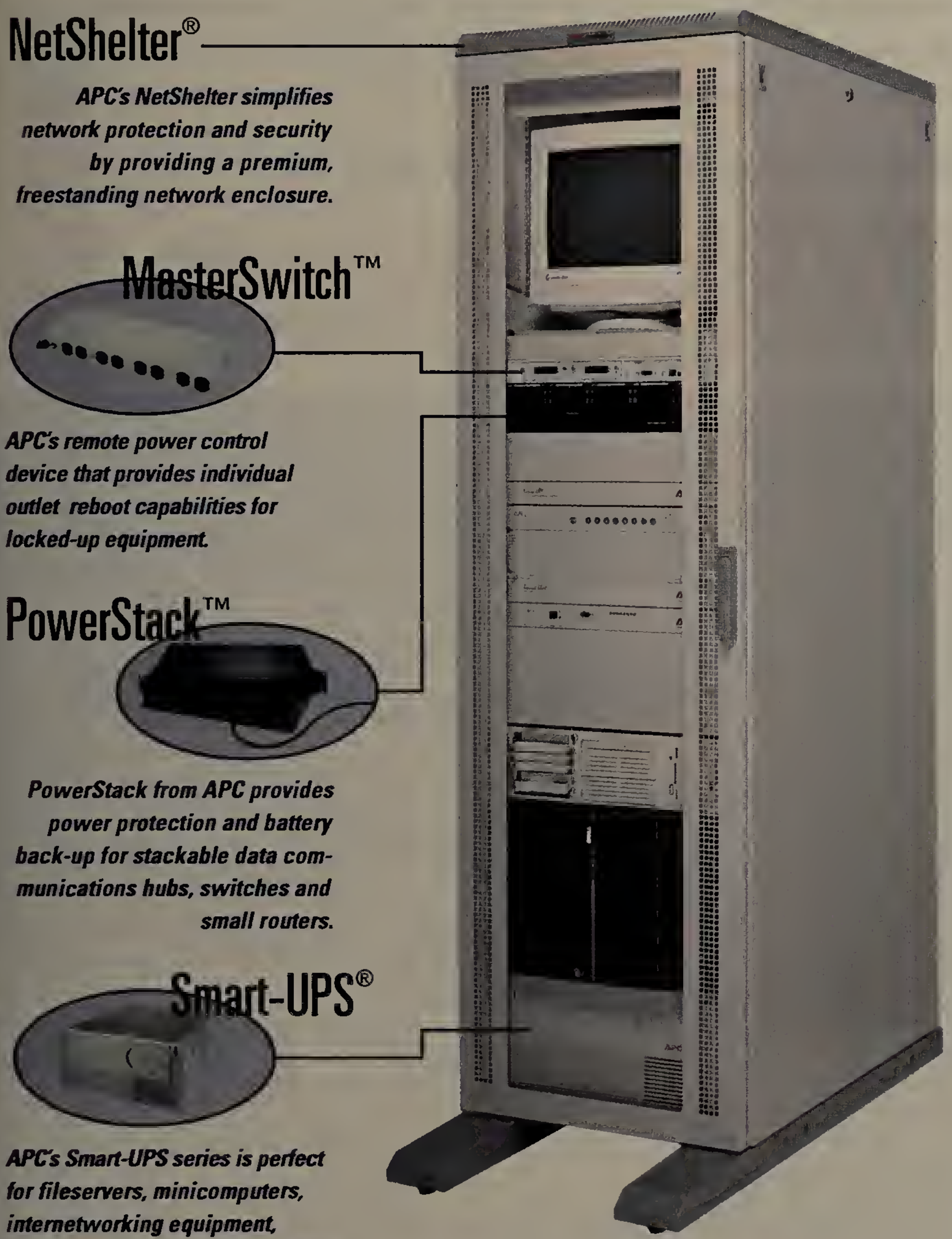

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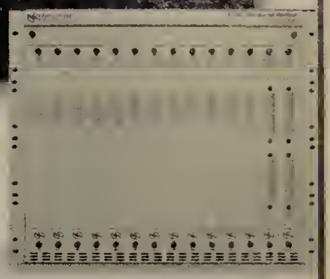

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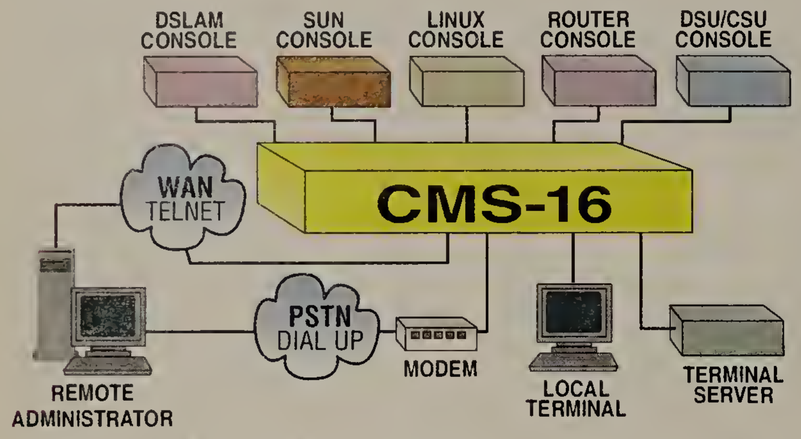

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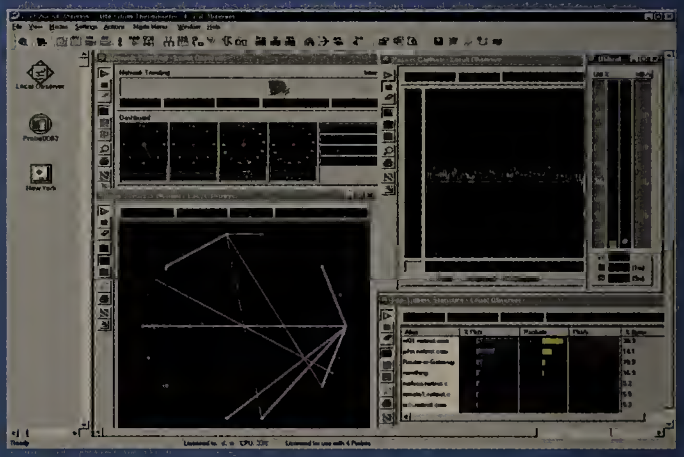

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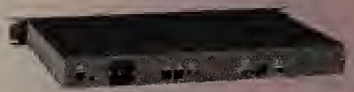

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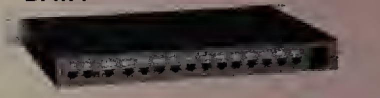

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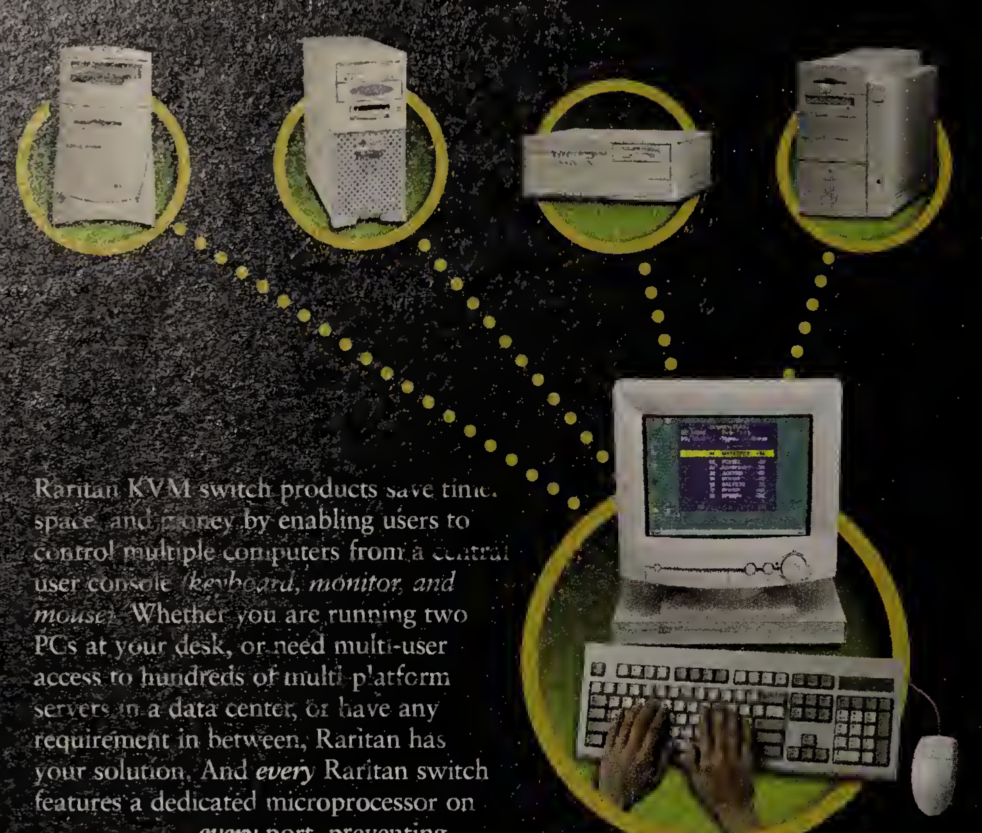

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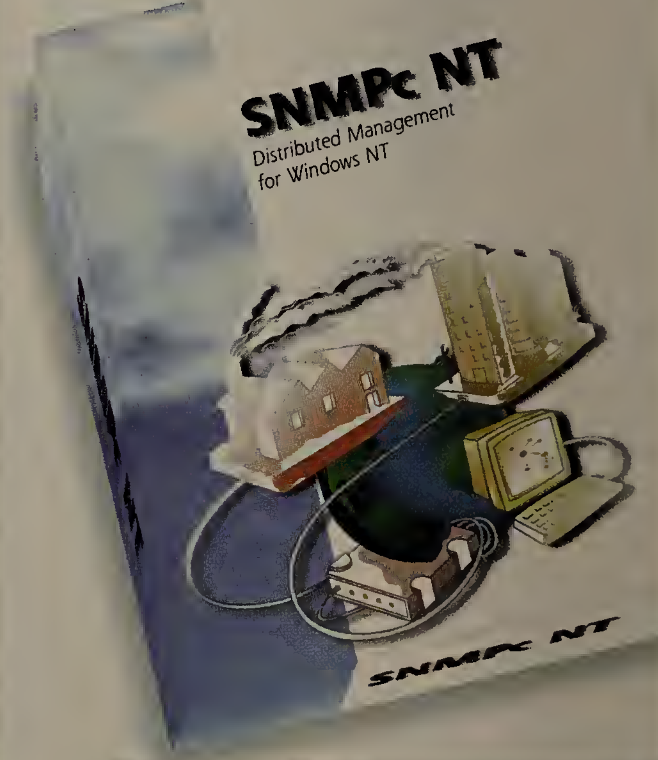

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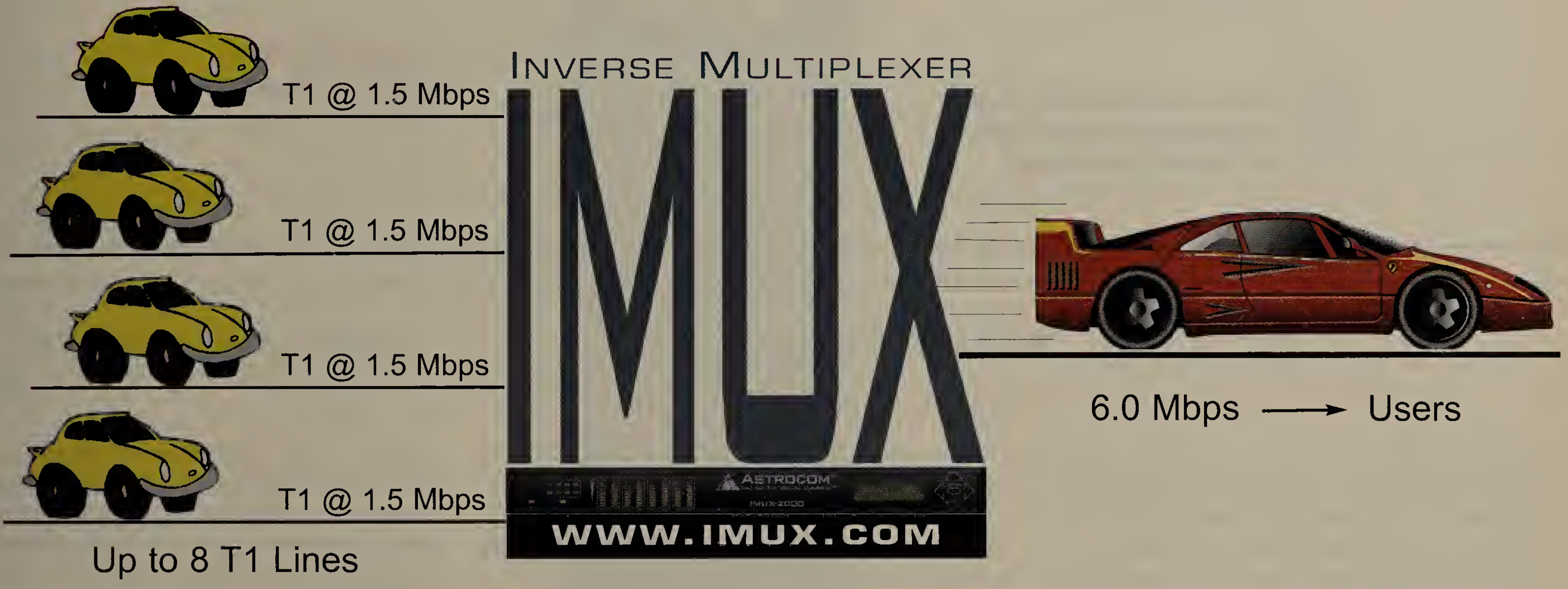

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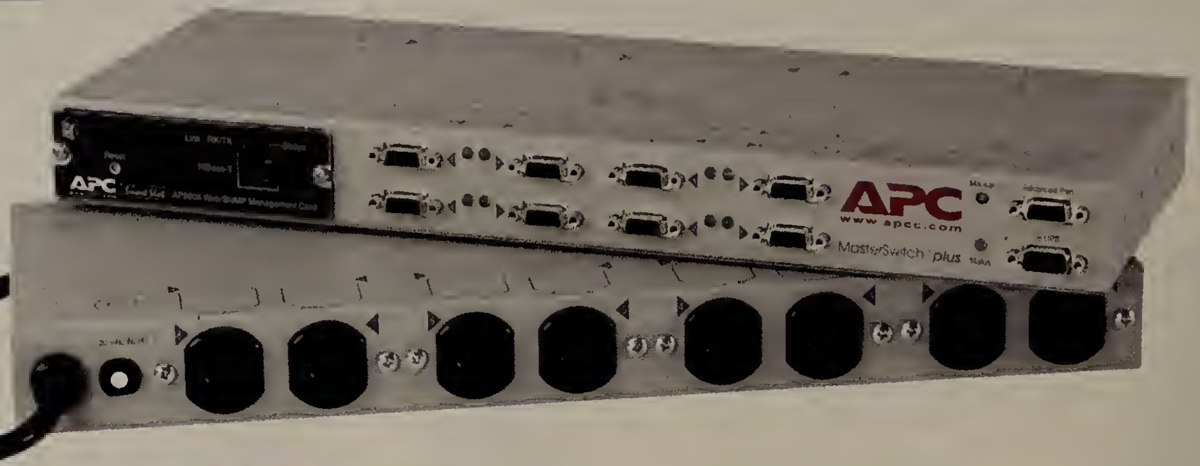

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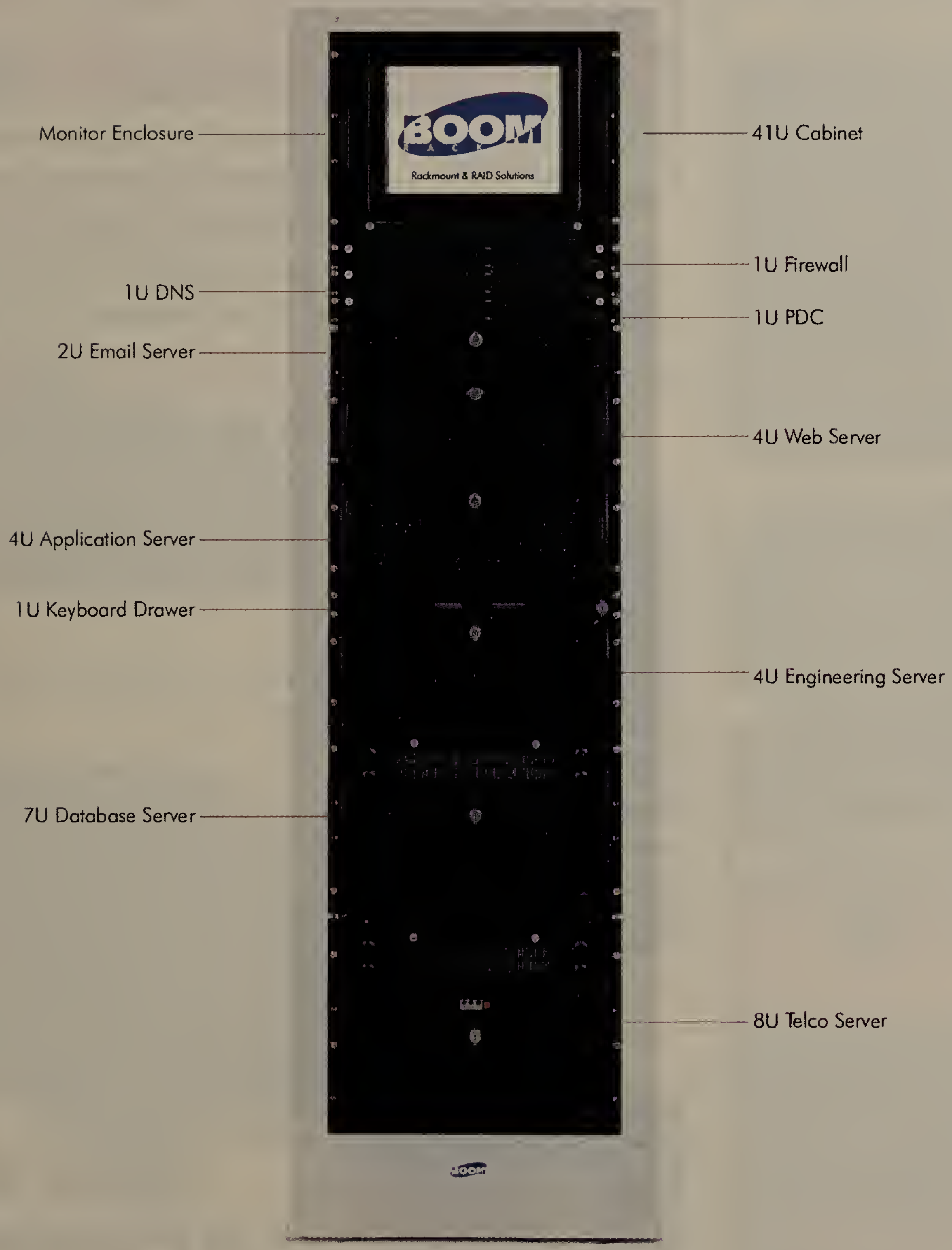

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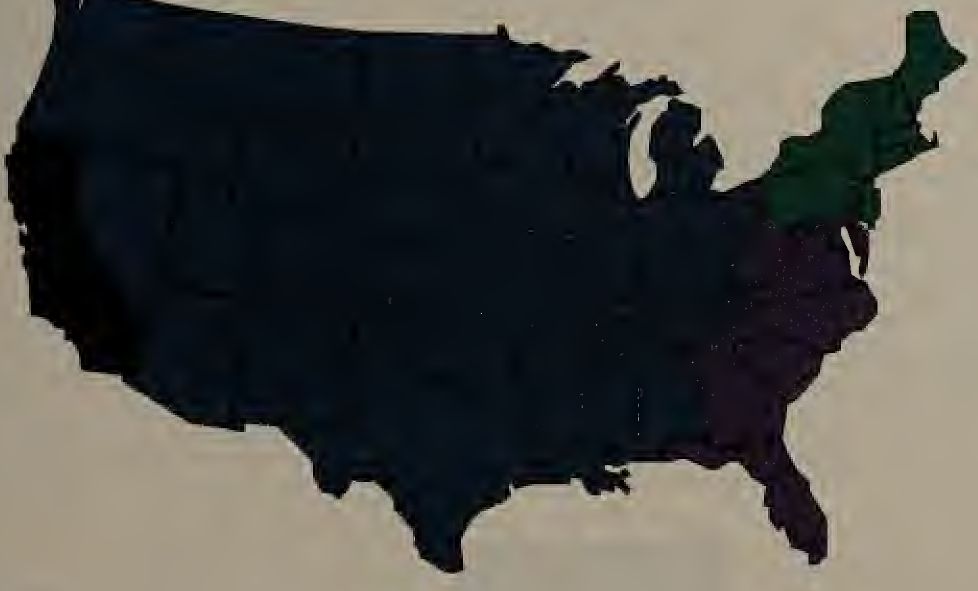

■ Cara Peters, Account Manager, California & Hawaii
Tel: 800.622.1108 ext. 6505 Email: cpeters@nww.com

🟦 Karima Zannotti, Account Manager, Central US/Pacific Northwest
Tel: 800.622.1108 ext. 6469 Email: kzannotti@nww.com

🟩 Richard Black, Director, New England, PA, NY, NJ
Tel: 800.622.1108 ext. 6596 Email: rblack@nww.com

🟪 Amie Gaston, Account Executive, Mid-Atlantic/Southeast/Canada
Tel: 800.622.1108 ext.6408 Email: agaston@nww.com

⬜ Enku Gubaie, Account Manager, Column Inch Ads/Card decks (Canada)
Tel: 800.622.1108 ext. 6465 Email: egubaie@nww.com

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Our E-Commerce Practice is currently seeking highly motivated professionals to create innovative and pragmatic strategies to resolve business issues and analyze complex E-Business data.

Project Managers

Supervise the technical design and development of E-Commerce strategies, determine/delegate staff responsibilities, and evaluate new client prospects as needed.

Architects/Developers

Requires 3+ years of hands-on technical experience in Java, JavaScript, C++, HTML, DHTML, EJB, ASP, XML, and CORBA applications; and technical experience designing at least 3 medium to large-scale websites. Knowledge of BroadVision, Interwoven, WebMethods, Vignette, Open Market, and/or Gemstone applications is preferred.

Both positions require a Bachelor's degree, proven leadership/ interpersonal skills, and the ability to travel. Opportunities are available nationwide.

We offer a comprehensive compensation and benefits package. Interested? Please forward your resume referencing Code C015AY01IT0 to: KPMG – Consulting Recruiting Center, 8200 Brookriver Drive, Suite 400, Code C015AY01IT0, Dallas, TX 75247; Fax: 1-888-ONE-KPMG; or E-mail: jeannejobs@kpmg.com. (All resumes must indicate Code.) No phone calls or agencies please.

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Financial Systems Manager - Will provide technical direction and leadership in building the technology infrastructure of a mid-sized company, through preparation and tracking of annual budgets, understanding the business process requirements of the private equity financial institution, and providing appropriate technological and business process change solutions. Will supervise the development of user specification document, functional specification document, and technical design document by working closely with cross-functional client user groups. Analyze business requirements and recommend system architecture; identify system components, plan, and estimate time resources, and cost for development, recommend hardware and software technology to develop mission critical business applications; project manage complex client/server financial systems implementations, including the design and implementation of financial systems; web site design and connect to the back office financial systems, and vendor IT relations at multiple locations. Requirements include: Bachelor's degree in Finance, Computer Science, or Business AND one (1) year experience in job offered OR one (1) year developing web-based contact management systems. Candidate must also possess demonstrated expertise designing and implementing mission-critical financial and document management client/server systems; demonstrated expertise designing and implementing web-based systems and integrating them with legacy client/server financial systems; and demonstrated expertise project managing multiple IT support, telecommunications, software and hardware vendors in the financial services industry. Salary: $70,000 per year; Monday to Friday, 9:00 a.m. to 5:00 p.m. Submit two resumes to: Case No. 19991497, P. O. Box 8968, Boston, MA 02114. EOE. Applicants must be US workers eligible to accept full-time employment in U.S.

Systems Analyst. Job Order # GA 6498231. Job Site: Atlanta, GA. Design, development, testing, maintenance & on-call support of a computerized retailer financial system. Projects done on IBM 3090 mainframe with MVS/ESA operating system using IDMS/ADSO, IDMS/R database & VSAM. 9AM-5PM, 40/hrs/wk. $65,000 YR. Req: BS Computer Science, Engineering or equiv. Plus 1 and 1/2 years exp in job offered. Must know: IBM 3090 mainframe, MVS/ESA OS, IDMS/R database with IDMS/ADSO (V10.2 & V12.0), VSAM, COBOL, COBOL II, DC-COBOL, Easytrieve Plus V6.1, JCL. Report or send 2 resumes to: Georgia Dept of Labor, Job Order #GA 6498231, 2943 N. Druid Hills Rd., Atlanta, GA 30329-3909 or the nearest Dept of Labor Field Service Office.

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Software Engineer. Perform software system programming and design development of Riposte, an Escher proprietary software used for counter automation and other functions in Post Offices and other public and quasi public agencies. Will also coordinate efforts on certain Riposte development subsets and programmer tools to insure resources efficiently allocated to minimize overlap of effort and to meet target timetables. Build applications using the latest programming tools and methodologies. These include object oriented design, and graphical user interfaces. Responsible for ongoing design and development of point of sale solutions as well as provide user support to existing customers of recently released Software Development Kit. Develop devise drivers in C++ for the Riposte I/O system. R & D work involving wireless data networks and personal digital assistants and their possible use within the Postal System. BS or equivalent in CS or related field. 3 years exp. in job offered or related field such as Software development. Experience must include three years exp. pre or post degree in software development one year of which must be in developing financial software for postal clients. Such exp. must include C++, Visual Basic, CO., developing in windows NT environment. Must be willing to travel to various client sites. 40 hours/wk 9am-5pm $105,000 per year. Applicants should send resume in duplicate to Case #19992126 PO Box 8968, Boston, MA 02114

Full-time System Communication Analyst III analyzing College needs and working to acquire appropriate hardware and software; working with all departments/schools in designing, installing, and maintaining complex network systems; supervising part-time employees and providing technical support for the College network and workstations in all areas of the College; advising and assisting departments/schools in training personnel to assist at the college level with regard to network and workstation support; acting as liaison between the College and the Computer Center; and designing and creating documentation for workstations and network systems. On call 24 hours a day in cases of hardware malfunction. Must have a Bachelor's degree in Computer Information Systems or related field or foreign degree equivalent. Must have 4 years of experience in the job offered or four years of related experience; or a high school diploma or GED and eight years related experience; or a combination of training and experience. Educational or work background must have included experience with microcomputers, peripheral and data communications hardware, local area network systems and applications software, and experience with Novell 4.1, UNIX, and Macintosh networking and hardware; experience with providing support for operating systems on various hardware platforms with a concentration on support of networked systems and applications. Salary $47,345/yr. Apply in person or send two resumes to: Georgia Department of Labor, Job Order #GA 6501429, 2636-14 M.L. King Jr. Dr., Atlanta, Georgia 30311 or the nearest Department of Labor Field Service Office.

Lead Software Engineer-Deerfield Beach, FL. 40 hr/wk, 9am-6pm. OT varies, $78,488/yr. Pos req Masters in Comp Engg/Sci & 4yr exp as comp analyst, prgmr or tech'l. Duties incl research, dsgn & dvlp comp s/ware systms in conjunction w/hardware product dvlpmt for medical, industrial applics; apply principles & techną of comp sci, engg & math'l analysis; interact w/clients regarding s/ware reqmts to determine feasibility of dsgn w/in time & cost restraints; consult w/hardware engrs & other engg staff to evaluate interface b/w hardware & s/ware, & operational & performance reqmts of overall systm; formulate & dsgn s/ware using scientific analysis & math'l models to predict & measure outcome & consequences of dsgn; dvlp & direct s/ware systm testing procedures, prgmg & documentation; consult w/customer re: maintenance of s/ware systm; may coordinate installation of s/ware systm; supv 5 other s/ware engrs & deal w/ upper mgmt decisions re: budget & cost analysis. Must have knowl of following comp langs, d/bases, platform, internet & pckgs. VB 6.0, 5.0, 4.0, 3.0, C, C++, Pascal, Java, Cobol, SOL, PL/SOL, Pro*C, SOL*PLUS, IIS 4.0, Index Server, MTS, ASP, CGI (Using VB), Front Page 98, Win 98, Win 95, Win NT, Win 3.11, UNIX (SUN OS 4.1.4), DOS, OS/2, MS-SOL Server 4.21A-6.5, Oracle 7.0, 6.0, MS-Access, Forms 4.0, Foxpro 2.5, Erwin-ERX, MS Office, MS Project 98, VSS 4.0-5.0, PVCS, Auto Tester 3.0, Crystal Reports 4.0, 5.0, 6.0, Easy Case & OMTOOL. Send resume to: dept of Labor/Workforce Prgm Support, PO Box 10869, Tallahassee, FL 32302, JOFL#2067485.

Full time Systems Engineer responsible for analyzing software requirements for the company and the company's clients. Evaluates interface between hardware and software, and operational and performance requirements for the overall software system. Using C/C++, Delphi, TCP/1P, system software and user software specification-writing and coding. Responsible for the architecture, operations and procedures, the database structure and data definitions, likely configurations problems and any necessary solutions. Responsible for the system interfaces with third party systems, and for the successful operations of the computing systems and networks. Training both the company and client's staff. Provide consultancy and feasibility reports on data transfer and operations for new customers. Provide after sales support to clients in the U.S. on behalf of the overseas company. Oversee and maintain numerous aspects of the day-to-day operations of the company and provide feedback to the software development team overseas. Documentation of system design, implementation and procedures. Must have a Master's degree in Electronics Engineering or foreign degree equivalent accepted. Must have 2 years of experience in the job offered or 2 years of experience in a position with same duties. Salary: $77,430.00 Send resumes to: Karla Del Rio at Marconi Online Inc. 120 Interstate North Parkway, Suite 118 Atlanta, Georgia 30339

UNIX Administrator to perform UNIX administration functions on Sun Solaris, AIX and SUN OS operating systems. Provide UNIX administration services to customers including hardware & software troubleshooting, user account management implementation & maintenance of security. Perform data backup & recovery using LEGATO backup software & monitoring capacity analysis. Engaged in on-going projects including installation of servers & workstations, operating systems upgrades, server restructuring, installation, maintenance, backup & recovery of ORACLE database, installation & administration of ClearCase, local area network (LAN) migration & performance tuning. Requires B.Sc. in CS, EE or Electronics plus 2 years experience in job offered OR 2 yrs exper in UNIX administration. Candidate must also possess demonstrated expertise performing ORACLE database administration; demonstrated expertise performing network administration on SUN Solaris, AIX, and SUN OS operating systems; and demonstrated expertise performing ClearCase administration on SUN Solaris AIX operating systems. Sal: $65,000/yr; M-F, 9A-5P. Submit 2 copies of resume to Case # 19992143, PO Box 8968, Boston, MA 02114. EOE. Applicants must be U.S. workers eligible to accept full-time employment in U.S.

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Consultant: consult with clients in the telecom industry to install, maintain and customize package solutions for billing and management systems; design, develop, test and implement applications in a Unix environment using Oracle, C, Pro*C, SOL, SOL*Forms, Shell Scripts; provide coding and data modeling; program, test & integrate modules into application systems; develop test data and execution of test procedures to accomplish validation of specifications and user requirements.

Bachelor's Degree in Engineering or Computer Science required. Two years experience in the position or two years as Developer &/or Consultant &/or Research Assistant required. Experience in related occupation must include design and development of computer applications using C, Oracle and SQL in an UNIX environment.

40 hrs./wk.; 8:00 a.m. - 5:00 p.m.; $70,000/year. Must have proof of legal authority to work in the U.S.

Apply in person or send two copies of resume to Georgia Department of Labor, Job Order # GA 6488672, 2943 N. Druid Hills Rd., Atlanta, GA 30329 or the nearest Department of Labor Field Service Office. AN EMPLOYER PAID AD.

SENIOR SOFTWARE CONSULTING ENGINEER

Perform a lead role in on-site user research including identification and analysis, design, development and implementation of industrial and business software systems and applications utilizing Oracle and its related tools, Sybase, SOL-Server, Visual Basic, Power Builder, Crystal Reports, Lotus Notes and Ingres on WINDOWS, DOS and UNIX platforms; direct software testing procedures and documentation; Perform business process re-engineering including migrating large volume applications systems on multi platforms using data conversion tools. Education & Experience: MS Comp. Science./Related Field with 3 yrs.experience in job offered including one year exp. in a lead position. Alternately, B.S./B.A. degree in Comp. Science/Related Field and five years exp. in job offered including 12 months exp. in a lead role is accepted. Salary: $70,000/yr. Benefits: major medical for self, vacation, and sick leave; This is a consulting position and travel/stay at client locations within the US is required. Applicants having proof of legal authority to work in U.S. respond to Georgia Department of Labor, Job Order # GA 6501833, 2943 N. Druid Hills Rd., Atlanta, Georgia 30329 or the nearest Department of Labor Field Service Office.

Senior Consultant-Responsible for a broad range of Business Solutions Group (SAP R/3) consulting activities working with current and prospective clients. Duties include sales negotiations and presentations, development of business plans and presentations; manage development of complex documents; develop and manage engagement workplan and execution; select modify and use consulting tools; troubleshoot problem areas; prepare and coordinate development of quality deliverables; participate in the development and delivery of local training programs. Requirements include a Bachelor's Degree or equivalent in Engineering or related field and three years of experience in the implementation of Manufacturing or Business applications. Experience must include participation in a SAP R/3 project. Applicants must have unrestricted authorization to work in the United States. Salary $80,000/year. 40 hours/wk. Respond with two copies of resume to Case #19991429, P.O. Box 8968, Boston, MA 02114

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Senior Software Engineer. Lead a group of software engineers in the design and devp. of database software, maintenance of existing programs, analyzation and correction of existing systems using C, C++, Oracle, VisualBasic, PowerBuilder, & Tuxedo for UNIX & Windows NT environments. Requirements: Master's Degree in Comptr Sc., Math, Elctrcl Engrng, Mech Engrng, Physics or related field, plus 2 yrs. experience job offered as a Comptr. Consultant, Programmer, Analyst or related tech occ. Related occ. experience must include a minimum of 2 yrs. exp. in the design & devp. of database software, maintenance of exisiting programs, analyzation & correction of existing systems using C, C++, Oracle, VisualBasic, PowerBuilder, & Tuxedo for UNIX & Windows NT environments. Salary: $76,252.80, 8am-5pm, 40 hrs/wk, M-F. Applicants should respond to Case # 19991427, PO Box 8968, Boston, MA 02114. Applicants should submit two copies of his/her resume in response.

SENIOR SOFTWARE ENGINEER to provide on-site consulting to determine and evaluate user requirements, develop specifications; analyze, design, develop, test and implement applications software using JCL, VSAM, COBOL, DB2, CICS, Sybase, MS-Access, SAS, File-Aid, Intertest, Crisp on MVS, Windows NT and UNIX operating systems; formulate plans outlining steps required for program development using structured analysis and design; create business rule documents, flowchart and mapping documents using MS-Word, Visio and Excel. Require: M.S. (or equivalent) in Computer Science and two years experience in the job offered or as Programmer. 40% travel to client sites within the United States required. Salary: $70,000 per year, 8 am to 5 pm, M-F. Send resume to: H.R. Manager, 4C Solutions, Inc., 4601 Six Forks Road, Suite 500, Raleigh, NC 27609.

SOFTWARE ENGINEER: Using ORACLE CASE*Designer to produce Entity relationship diagrams (ERD), Data Flow Diagrams (DFD) and Functional Hierarchy diagrams. Using the ORACLE tool set SQL* Forms, ORACLE*Forms, SQL*Report writer, Oracle*Reports and SQL*Plus. Developing procedures, functions and database triggers using PL/SOL for server-end processing. Job duties are analysis of current procedures and problems to refine and convert the data to programmable form; determine output requirements, study existing system to evaluate effectiveness; correct system/programs as necessary. Requires Bachelors in Engineering with 2 years of software development experience. 40 hours per week at $ 52,000 per year. Please send resume to Case # 19992146. PO Box # 8968, Boston, MA 02114

SENIOR SOFTWARE ENGINEER

with 2 years of computer-related experience to design, develop and implement software applications using Oracle, Developer 2000, SQL, and Unix. Excellent communications skills and a Master's degree or equivalent required. FAX resume to HR 7819374976 or email: tbetti@raymondkarsan.com

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- VB, VC++, ActiveX, MS SQL Server
- Sybase Dvlprs/DBA w/Delphi
- Vbscripts, ASP, Visual Interdev, Visual Studio
- Network Engineers w/Routers, Hubs & Bridges exp.
- Sun/HP Unix Systems Administrators
- AS400, RPG 400, ILE, BPCs or EDI

All positions require a Bachelors degree and at least 2 yrs exp. Send resumes to: HR Dept, Genesys International Corp., 110 Corporate Park Dr, White Plains, NY 10604.
Attn: Sol. Fax: (914) 694-1263.
www.genesysco.com

Software Engineer: Design, develop, code and test complex real-time multi-tasking embedded software systems for automation systems based on Motorola 8/16/32 bit processors in C/C++ and Assembly language using cross development systems, debugging monitors and microprocessor emulators. Design, write and code serial port device drivers. 40 hrs/wk, $70,000 / yr. Requires Master's degree in Electrical Engineering or Computer Science, 1 year experience software development inclusive of designing, coding, testing, debugging and maintaining real-time multitasking embedded systems. Demonstrated knowledge of automation systems, Motorola 8/16/32 bit processors, C/C++, Assembly, cross development systems, debugging monitors, microprocessor emulators, UNIX and PC platforms. Must be US citizen, permanent or lawful temporary resident, refugee or asylee. Send 2 resumes to Job Order 19991923 P.O. Box 8968, Boston MA 02114.

SOFTWARE ENGINEER: Using Oracle Database Administration tools Server Manger, Oracle Enterprise Manager, Import, Export, SQL*Loader, SOL*plus, PL/SOL. Knowledge in developing applications using Developer 2000, Designer 2000 and languages like SOL, PL/SOL and PRO*C. Writing Database triggers, Procedures and Functions for implementing business rules. Using UNIX, WINDOWS operating systems. Ability in writing Shell Scripts and C Programming for running CRON jobs. Job duties are Analysis of current procedures and problems to refine and convert the data to programmable form; determine output requirements; study existing systems to evaluate effectiveness; correct systems/programs as necessary. Requires Master in Engineering or equivalent with no experience required. 40 hours per week at $75,000 per year. Please send resume to Case # 19990771, PO Box # 8968, Boston, MA 02114.

Programmer/Analyst: Analyze, design, develop, test and implement application software using Oracle 7.3 and Oracle 7.x and Oracle tools including SOL, Oracle Forms, Oracle Reports, PL/SOL, and SOL. Provide technical assistance with system maintenance after modifications enhancement has been implemented. Experience using Oracle RDBMS. Proven ability using Oracle Developer 2000 namely Forms 4.5 and Reports 2.5. Demonstrated Ability using the Oracle tool set in developing procedures, functions and database triggers using PL/SOL. Knowledge of C, Unix and Windows 95NT. $71,000/yr. 40 hr/wk. 8am-5pm. Must have Masters Degree in Comp. Sci. and 2 yrs. software development exp. Will accept B.S. plus 5 yrs. progressively responsible exp. Submit 2 resumes to: Case # 19983858, P.O. Box #8968, Boston, MA 02114

Computer/IT Enterprise Solution Manager. (Atlanta) Req. master's degree in computer, technical or business administration fields, with 5 yrs.' consulting exp. in all phases of the business systems development lifecycle, including team lead and project management experience. (In lieu of master's degree and 5 yrs.' exp., will accept bachelor's degree or foreign equivalent with 7 yrs.' progressive post-baccalaureate exp. as stated.) Exp. must include one SAP implementation and configuration in both FI/CO and MM. Exp. must also include resource management and the development of quality, security and control measures within information systems. Must be willing to travel full-time during the week. Salary range $85,000 to $110,000/yr dep. on edu. & exp. Apply to Kurt Salmon Associates by sending resume and cover letter via e-mail to recrges@kurtsalmon.com. All responses must be addressed to Dept. GES1355.

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Sr. Software Engineer wanted to design, develop & implement software in Visual C++ for Show N Tel (Voice Mail Develop. Tool Kit) system running under Windows NT, incl. design & develop. of Show N Tel GUI modules, Visual C++ class design & develop., general MFC app. develop., & COM/DCOM objects develop. Must have Master's Deg. in Comp. Sci., Elect. or Comp. Eng., 2 yrs. software design & develop. exper. incl. exper. with multithreaded programming concepts, OLE or related software, GUI design & develop., Signal/Image Processing & speech or pattern recognition, & prof. with ActiveX or related software. Salary $72,441/yr., 40/hrs/wk. Send two (2) resumes to Case # 19991139, Box 8968, Boston, MA 02114.

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Computer - Product Development Manager. $92-97,000. Teaneck, NJ. Position req's a BS in Computer Science or Engineering. A min 7 yrs exp in systems mgmt & 3 yrs in Forte. Skill set incl architecture development of database systems, design of large scale applications & development of fault-tolerant solutions. Responsibilities include managing the development & installation of an integrated toll systems software product, the development & evolution at the technical architecture, providing guidance to the development team & architectural support of deliveries of the finished product. Please fax inquiries to Erin McWilliams at 201-836-4466 or erin.k.mcwilliams@lmco.com. EOE

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Senior Software Engineer-40hrs/wk; 9:00 a.m.-6:00p.m., $72,441/yr. Develop and implement diagnostic parsing tools, date identification protocols and auto correction routines for mass Y2K conversion of large scale, multi-language, distributed systems utilizing programming skills in C/C++, VB, Sybase, Unix, Shell Scripts, Perl, Awk, Client/Server, Distributed database systems, Parser, Interpreter/Compiler. Must have a M.S. in Computer Science and 2 years experience in job offered or 2 years experience in a related occupation (Programmer/Analyst Software Engineer or equivalent.) Please send 2 resumes to: Case#19990934 P.O. Box 8968, Boston, MA 02114.

SR. SOFTWARE ENG/CONSULTANT Design, develop, troubleshoot software programs. Systems modeling, simulation & analysis in designing assemblers, liners, compilers & operating systems. Analyze, design, customize, implement EDI, E-Commerce, supply chain mgmt & Enterprise Integration application systems. MS Engineering, Computer Sci, or equiv; 2 yrs exp Programmer/Analyst; proficiency in ABAP/4, C, Fortran, Java, Oracle 7x , 8x, MS Access, MS Project and PERL; exp w/ HP-9000, HP-712, Sun Spark, IBM PC, Windows NT/95/2000, Unix, Linux & Sun Solaris, Enterprise Integration application (SAP R/3 & People Soft), EDI, ANSI X12, EDIFACT, and XML. $74,500/yr. Send resume to: Lisa Phillips, Harbinger Corp, Ref#RPT, 1277 Lenox Park Blvd, Atlanta, GA 30319.

Sr. Software Engineer - Write computer programs, database administration & data handling. Use Progress & shell scripts on Windows 95/NT & UNIX platforms. Req: Bach in Comp. Sci., Math or Engr or any Sci. & 18 mos exp. Employer is a computer consulting company. Relocation required to client sites for periods from 6 mos to 2 yrs. M-F, 8AM-5PM, 40 hrs/wk, $53,000/yr.

Send 2 copies of resume to: Case # 19991481, PO Box 8968, Boston, MA 02114

Systems Administrator wanted by Non-Profit Guarantor of Student Loans in Boston, MA. Must have Bach or equiv in Comp Sci, Elec Engg or related field & comp related exp. Respond to: HR Dept, American Student Assistance Guarantor, 330 Stuart St, Boston, MA 02116.

Systems Analyst-35hrs/wk, 9:00 a.m.-5:00 p.m., $26.92/hr, Analyzes user requirements, procedures and problems to automate processing or to improve existing computer systems; reviews computer systems capabilities, workflow and scheduling limitations to determine if requested program or program change is possible within existing systems. Must have a M.S. in Information Systems or Computer Science. Must possess skills/abilities in statistical analysis; database design and management; cost analysis; quality control; Windows NT and SOL and troubleshooting. Please send 2 resumes to: Case#19982930 P.O. Box 8968, Boston, MA 02114

Systems Analyst - 40hrs/wk, 9:00a.m.-5:00p.m., $53,254/yr. Provides post-sales business management support on our intelligent computer-based telephony platform. Responsibilities include site planning, system application, customer training and initial on-site system support. Must have a Bachelors degree and 2 years experience in job offered or 2 years experience in a related occupation (Account Manager or the equivalent.) Please send 2 resumes to: Case #19990951. P.O. Box 8968, Boston, MA 02114.

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Systems Analyst wanted by Data Communications & Cabling Services Co in New York, NY. Must have BS in Comp Sci & 2 yrs exp administering enterprise-level system integration & technical support of all Win NT systems. Respond to: James J. Dooling, Align Communications, Inc., 845 Third Ave, 13th Fl, New York, NY 10022.

Sr. Programmer/Analyst, Columbia, MD. Analyze, design, develop, debug, optimize, implement & test software applications & GUI components, using Borland C++ Builder, COM, ACE Reporter, BDE, SQL, & Delphi. Reqd. M.S. or equiv. in Computer Science & 6 mos related exp. M-F, 40hrs/wk + O/T. Send resume to S. Monacelli, HR Ref. # 222, Maxim Group Inc., 6992 Columbia Gateway Drive, Columbia, MD 21046.

Software Engineer, Stoneham, MA; Design,develop & implement VLDB Transaction processing appplications over the Intranet/Internet using OWAS (Oracle WebServer) & Lotus Notes Domino Server. Implement Data Bridge from Oracle multi-dimensional Database. Perform Performance Tuning & provide technical support. Req'd. Masters in Comp. Applic. or Comp. Sci. or Engg. or Math. 1 yr exp in job offered or 1 yr. exp as Senior Executive. 40 hrs/wk. 9a-6p. $78,000/yr. Applicants should submit 2 copies of resumes in response to Case #19991052, P.O. Box #8968, Boston, MA 02114.

Programmer Analyst wanted by Software Dvlpt Firm in NYC. Must have Bach Degree in Comp Sci, Engg or Math & 6 mos s/ware exp. Must know Visual C++/MFC & Visual Basic. Respond to: OBT, LLC, 665 Broadway, 11th Fl, New York, NY 10012.

Programmer/Analyst wanted by Internet Application Management Services Firm in Wayne, NJ. Must have Bach in Comp Sci, Comp Engg or Elec Engg & 1 yr exp planning, dvlpg, testing & documenting comp s/ware for internet/Intranet applics using HTML, Active Server Pages, VB Script & JavaScript & SQL in Win envrmt. Respond to: HR Dept, Marc Weather, Cutler Systems Management, 155 Willowbrook Blvd, 5th Fl, Wayne, NJ 07470.

Programmer Analyst wanted by Book Dealer Co in Atlantic City, NJ. Must have Bach or equiv in Comp Sci, Engg or related & 2 yrs s/ware exp. Respond to: HR Dept, Princeton Antique Books, Inc., 2917 Atlantic Ave, Atlantic City, NJ 08401.

Software Engineer wanted by Tennessee based Specialized Comp Consultancy Firm for job loc throughout the US. Must have BS in Elec Engg & 2 yrs comp exp. Respond to: HR Dept, Allied Informatics, Inc., 9111 Cross Park Dr, Ste D200, Knoxville, TN 37923.

Software Engineer, Boston, MA; Analyze,design,develop, test & maintain three tier object oriented applications within mixed Windows & UNIX environments using GUI, C++, Client/Server architecture & RDBMS. Req'd Masters* in Engg. or Comp Scie. or Math. 1 yr exp in job offered or 1 yr exp in a Computer Related Profession or Sr. Development Officer. *Will accept Bachelors degree & 5 years of experience in lieu of Masters. 40 hrs/wk, 9a-6p, $80,000/year. The Applicants should submit two copies of resume in response to Case # 19991479, P.O. Box 8968, Boston, MA 02114.

IT PROFESSIONAL
Systems Analyst/Project Manager

Atlanta Based MAJOR FINANCIAL SERVICE ORGANIZATION Management of I.T. infrastructure- applying cost/benefit analyses, and deploying structured programming methodologies and CASE tools to ITsystems analysis and design. Contact: Eleanor Heppner (212) 314-5166 Email: heppner@strategicexecutives.com. Fax: (212) 314-5290 eoe m/f

Compaq Computer Corporation seeks Systems/Software Engineers, various levels, for eastern NJ offices. Responsible for testing, development, debug, maintenance. Positions require a degree in CS or related field; degree required depends upon level. Some positions may require industry experience. Respond to: HR, Compaq Computer Corporation, 40 Old Bolton Road, Stow, MA 01775.

Computer Engineer wanted by Medical Office in Staten Island, NY. Must have 2 yrs exp analyzing data processing requirements to plan data processing system for multi site computer using RP400 & CL languages, analysis & mathematical models. Respond to: HR Dept, Island Internists, 420 Lyndale Ave, Staten Island, NY 10312.

Programmer Analyst:
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IT Careers in e-commerce/e-business

by Carole Hedden

A recent check of major American businesses points out the fact that e-commerce remains in its infancy - just 5 percent of the country's major manufacturing operations have a fully defined e-commerce strategy.

In this infancy, the e-commerce space continues to open doors for entirely new products and services for company's large and small.

Exactis.com
Denver, CO

Just as targeted direct mail capabilities developed as part of direct marketing, so too has targeted e-mail distribution as part of e-commerce. Exactis.com is the industry leader in providing a full range of e-mail marketing and communication solutions. "We distribute a wide variety of marketing and communication e-mails for our customers. In addition, we do the back-end tracking of who opens the mail and clicks through to the Web site; provide a complete customer service department and provide our clients with industry insight to make sure they are following anti-spamming guidelines," says Andrea Russell, human resources generalist for the company.

Exactis.com launched its business as Mercury Mail, providing business, sports and entertainment news updates to its base of more than two million subscribers. Today the company has more than 100 clients, from MSNBC Interactive to Charles Schwab & Co. and E-Greetings.com. "Our employees are developing cutting-edge technology because we must retain our position at the front of this industry," says Russell. "So you'll be working on projects that define new e-mail products and what e-mail will actually be in the future."

Exactis.com is looking for people with strong technical skills, particularly in UNIX, Perl and Java. "We also expect applicants to have been in the industry for a while, have good people and leadership skills and demonstrate that they know how to use their ideas for business."

In addition to offering the opportunity to develop next-generation e-mail capabilities, Exactis.com provides internal and external training and a full-scope benefits package.

"We offer you an opportunity that no one else can at this time because we are doing business that others aren't doing," Russell adds. "We have a very fun environment, where you'll be working on projects that last one week to three months, from development to full-scale implementation. That's fast turnaround and will keep you moving forward."

icarian
Sunnyvale, CA

Today's companies face a daunting challenge in building and managing their workforce. The processes, markets, services, vendors and technologies that currently comprise workforce management are perhaps the most fragmented and inefficient on earth. Based in Sunnyvale, CA, icarian has taken the lead in solving this through an innovative and ambitious approach to automating the workforce processes and integrating companies' B2B supply chains.

> "Our employees are developing cutting-edge technology because we must retain our position at the front of this industry."
>
> Andrea Russell
> Human Resources Generalist
> Exactis.com

"We're in the business of optimizing the workforce for companies, using the Internet," says Gary O'Neall, vice president of engineering. By optimizing, O'Neall is talking about every aspect of planning, hiring, and retaining people - from forecasting workforce needs, to identifying talent, to conducting background checks, to relocating people, to matching people's assignments to their evolving skills.

"We provide an e-commerce workforce solution for identifying talent that crosses all industries and assists very large and very small companies. We distinguish ourselves by focusing on all the roles in the workforce management process: line managers, human resource professionals, and executives all collaborate in our solution," says O'Neall. Through icarian's dynamically hosted services, customers' employees have access to this complete solution through nothing more than a standard web browser.

This service translates to a highly integrated and complex technology system that involves B2B supplier integration, data integration, and workflow processes. Because icarian's tools bring together input from a variety of suppliers - doing the background checks, moving new employees across the country - icarian is working to standardize some technologies. "We are in a leadership position within the human resources field on a consortium XML project. So we're looking for people who know Java and XML technologies, who have experience in building applications in the Internet environment," says O'Neall. "We're always looking for more senior engineers who have managed more than a couple of releases of software."

While icarian has fewer than 200 employees, it already is gaining big attention. It was listed by *Interactive Week* as the "#1 Company to Work For." Employees are provided with "icarian bucks", dollars that are allocated for ideas and spending to make icarian a better place to work and a better company. "There's a lot of empowerment involved in work but also in making icarian a better company overall," says O'Neall.

"We work hard at being a fun place," says O'Neall, who is one of several icarian employees who are members of the icarian rock-n-roll band. "There's a ping pong ladder and a hiking schedule. Generally, you find that we enjoy working together and have a lot of passion for producing excellent results."

Pitney Bowes, Inc.

Stamford, CT

Over the decades, Pitney Bowes has carved out a reputation as a technology company that enables postal service and messaging systems. Now, the company is transforming itself yet again as the marketplace shifts. "Our customers are changing and technology will enable us to work with them in ways that several years ago we would not have dreamed possible," says Fred Purdue, vice president and general manager for business re-engineering.

"My job is to look at where the business is going and determine what we need to enable the business," says Purdue, himself a business leader versus a traditional information technology leader. "We are inventing and discarding processes and technology, an equal challenge in reinventing the company."

Pitney Bowes' e-business projects lead the effort in the reinvention process. Purdue says they include back office projects and customer relationship management applications. "The intrigue for IT professionals is the ability to partner in ways we never have with the business. We need people who are accustomed to working in a faster e-business environment, who know what it's like to work in a less-than-certain environment. They'll be managing technology, but also managing ambiguity. You'll be making decisions constantly but also need to be fast, flexible and decisive that you can correct course while you keep moving ahead."

> "Our customers are changing and technology will enable us to work with them in ways that several years ago we would not have dreamed possible,"
>
> Fred Purdue
> Vice President and General Manager
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> Pitney Bowes, Inc.

Purdue is looking for people with software and integration skills and evidence of partnering with business functions. "You will be part of redefining the culture at Pitney Bowes so we aren't identifying a 'cultural fit'," says Purdue. "By and large, however, people are open here and tend to operate from an outside-in perspective. We're a financially sound company that has shown the ability to maintain profitability and business focus over our history.

"I'm 53 years old and am on the steepest learning curve of my life," he adds. "This is where you will continue to move forward, continue to reskill yourself. "You have, behind you, the where-with-all to reinvent something. Most of the e-business work we're doing is green field and you will be creating the environment to work to the limits of your capability."

Sequoia Software Corporation

Columbia, MD

While most companies talk about the fast pace and intellectual intrigue of developing entirely new technologies, Sequoia Software acknowledges that there's also room for a few innovative tools to help customers do more with the Internet.

Jennifer Spiegel, vice president of human resources, says the company most recently introduced an XML-powered e-business tool known as Xdex. "XML is showing up everywhere," Spiegel says. "Xdex is a tool that allows anyone creating, gathering or exchanging XML files to intelligently index and search this information."

For the past two years, Sequoia's focus on XML-powered solutions has helped drive its break-neck growth. "The new tool fills a gap," says Spiegel. "It works behind the scenes and is sold only through our web site."

Sequoia's flagship product, XPS - the XML Portal Server - actually incorporates Xdex as its indexing and search engine. "XPS, which is soon to enter its third release, is used for creating interactive e-business portals," explains Spiegel. "Interactive portals help users become more productive by reducing the time and effort required to find and act on the specific information they need. Xdex plays a significant role in the portal by organizing XML information in a contextually relevant manner."

Sequoia more than doubled in size in 1999 through solid growth and the acquisition of Radian Systems of Alexandria, VA. The company targets five vertical markets - financial services, insurance, healthcare, telecommunications/ technology and manufacturing. Sequoia is in the pre-IPO "quiet period" and can't comment on specific growth rates. Yet, according to Spiegel, "We need software engineers to help build and implement product, technical engineers to assist with sales, and web developers. Our target skill sets include C++, COM, ATL, VisualBasic and ASP experience."

"With all the growth last year and what we expect this year, we're focusing more attention to keeping people here," Spiegel notes. "We're offering stock options and quarterly bonuses, so you always know how your skills are matching up with the business objectives. The idea is that you can stretch to meet your potential. We also have a first-class training facility and staff that provide employees and clients with technical expertise on our products."

Sequoia's work environment also helps sustain employee morale and effectiveness. In addition to barrels of chocolate-covered candies and health food scattered throughout the offices, the company recently had massage therapists on site during product release preparation. "The massage therapists were a big hit and will be returning soon," notes Spiegel.

"We try to keep things informal and comfortable," says Spiegel. "We're looking for phenomenal people who fit with the positive chaos that is part of Sequoia."

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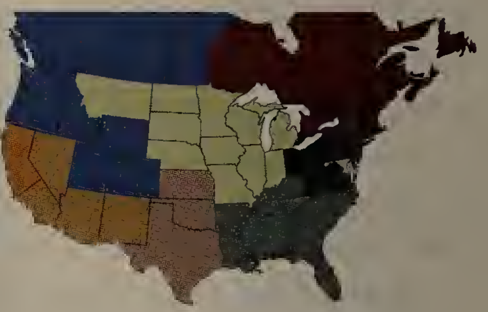

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Last mile,

continued from page 1

BROADBAND ACCESS BLITZ

Second in a three-part series.

- Lengthening the reach and boosting the bandwidth of DSL technology.
- Better managing the limited bandwidth available on cable access loops.
- Bouncing wireless signals off fixed objects so it is easier to lay out wireless networks.

In addition, vendors are tuning up their access networks to provide the service-level guarantees that corporations demand for high-performance virtual private networks and e-commerce. To support these services, providers are looking to deploy equipment that imposes priorities on their access lines.

"You need a gadget between the access network and the service core that creates explicit service grades," says Tom Nolle, president of CIMI Corp., a technology assessment firm in Voorhees, N.J.

These devices will guarantee customers the level of service they need for the applications they run, and at the same time make carrier networks more efficient, keeping down costs.

Broadband devices

The equipment will come in many forms. For example, start-up Quarry Technologies will announce this month a router designed to inspect packets down to the application layer. The gear will enable service providers to offer quality guarantees for specific applications, as opposed to a single quality for all traffic on a given access link.

The Quarry gear, as yet unnamed, can sit behind any broadband access network.

Another start-up, RiverDelta Networks, is developing a broadband router specifically for traffic running over cable nets. The Broadband Services Router (BSR) 64000 will manage customer traffic as it comes off cable loops where bandwidth is limited. Because cable capacity is shared, people who use high-bandwidth applications can drag down the access speeds of everyone else on the same loop.

BSR 64000 will monitor traffic on service provider networks, and allow customers to send and receive traffic in accordance with the service quality they have signed up for, the company says. The router is being built to DOCSIS requirements, which describe how to ensure quality of service (QoS) within cable access networks.

RiverDelta's router translates DOCSIS QoS levels to the schemes that are used in backbone networks to speed traffic such as Diff-Serv, Multi-protocol Label Switching and service qualities defined by ATM. These DOCSIS QoS features are expected to be included in customer cable modems later this year. RiverDelta's gear will also be customized later to manage wireless access networks.

The RiverDelta router is being designed with an eye toward the open cable access movement, an effort being pushed community by community that could change the face of cable services.

Under open access, the owners of cable networks will be forced to lease capacity to competitors so they can offer competing services. Backers say such competition will drive down prices and accelerate deployment of new services. Cable network owners say it would dampen plans to upgrade their networks to support cable modems.

Should open access come about, the BSR 64000 could be partitioned so different Internet service providers can offer services over the same cable network. These ISPs will be able to manage bandwidth for their customers, while being restricted from encroaching on bandwidth designated to other carriers, RiverDelta says.

Equipment makers are pushing similar service-quality technology into DSL networks. Last week, for example, Alcatel announced ATM Subscriber Access Multiplexer, which supports multiple service qualities based on ATM. These boxes can work with various flavors of DSL, including asymmetric DSL, G.lite DSL, and two-wire, high-bit-rate DSL (HDSL2). The box also supports ATM voice channels over DSL lines.

CrossKeys, a maker of network management software for service providers, last week introduced Dyband, software that can manage cable modem, DSL and fixed wireless traffic to deliver separate classes of service. Dyband will smoothly throttle traffic during congestion, so customers don't suffer broken connections or dramatic dips in performance, CrossKeys says.

Wireless options

Wireless providers are struggling with similar issues. Nortel is adding new technology to its Reunion fixed wireless gear so it can provide dedicated links for high-priority traffic, but also shared connections for customers who require a lower service quality.

The company already supports frequency division multiple access (FDMA) technology, which is suited to dedicating frequencies for use by a single customer. But it is also adding time division multiple access (TDMA) technology to its products. TDMA will allow wireless service providers to share access bandwidth among customers for traffic that is not as time-sensitive, such as e-mail.

Customers that need guaranteed performance could buy service based on FDMA, and those with less-stringent demands could buy a service based on TDMA, says John Skoro, marketing director for Nortel's broadband wireless group. TDMA will allow carriers to use available wireless bandwidth more efficiently, Skoro says.

Meanwhile, wireless equipment makers are still shopping around for a method of ensuring absolute QoS. Many LMDS vendors use ATM, says Jim Lawrence, program director at Stratecast Partners.

Other vendors are considering tapping into IP or cable's DOCSIS standard for their QoS schemes. The best QoS mechanism for wireless is not likely to be determined for a while, Lawrence says.

Wireless vendors also will develop point-to-multipoint equipment that communicates with several users via a single receiver, rather than point-to-point, which requires a separate receiver for each customer. Service provider Teligent is well along in its deployment, and WinStar and Nextlink are rolling it out now.

MCI is said to be testing prototype point-to-multipoint gear made by Cisco. It is not clear when that equipment will be available. Cisco bought fixed wireless expertise last year with its purchase of Clarity.

Overcoming hurdles

While managing the flood of broadband customer traffic is a top priority for vendors, they are also trying to overcome shortcomings of the access technologies themselves.

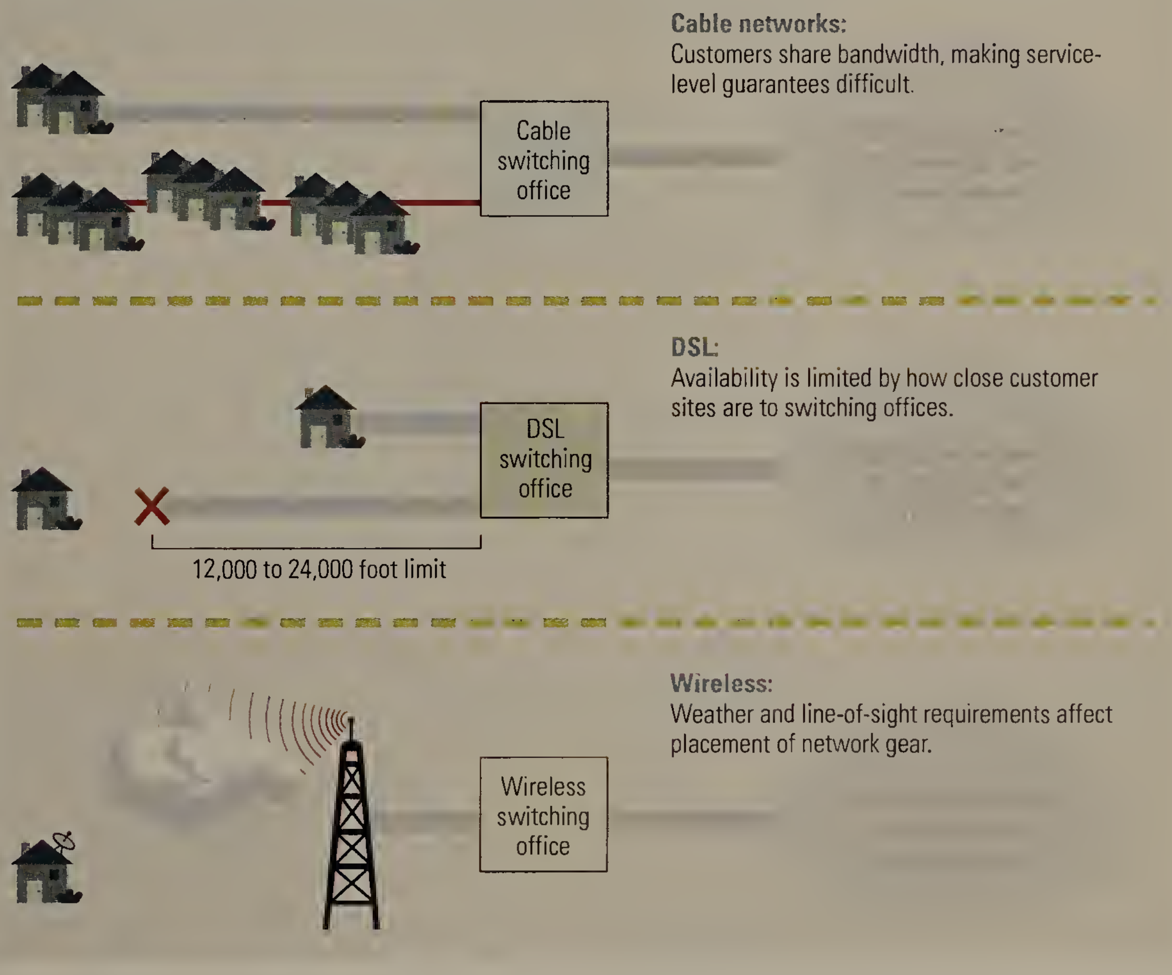
For instance, wireless vendors are close to beating a restriction that requires a clear line of sight between transmitters and receivers. They have figured out a way to bounce signals off fixed objects, such as buildings and trees, and still get an intelligible signal. Products that do this are not on the market yet.

But Cisco is using the technology, called vector orthogonal

See **Last mile**, page 102

Challenges in the last mile

Vendors are working to overcome the inherent drawbacks of cable modem, digital subscriber line and wireless access technologies.



Cable networks:
Customers share bandwidth, making service-level guarantees difficult.

DSL:
Availability is limited by how close customer sites are to switching offices.

Wireless:
Weather and line-of-sight requirements affect placement of network gear.

Spectrum,
continued from page 1

for multivendor APIs that will bolster Spectrum's ability to handle non-Cabletron hardware and work with third-party management applications.

In addition, the firm will announce a management technology called Prism, which uses a business intelligence engine to automate network and systems management. Prism will be an adjunct to Spectrum 6.0 in the future, Aprisma executives say.

More than predictions

Executives who briefed *Network World* say that eventually Spectrum and Prism will be able to not only predict network outages, but also determine their potential effects on users and the business.

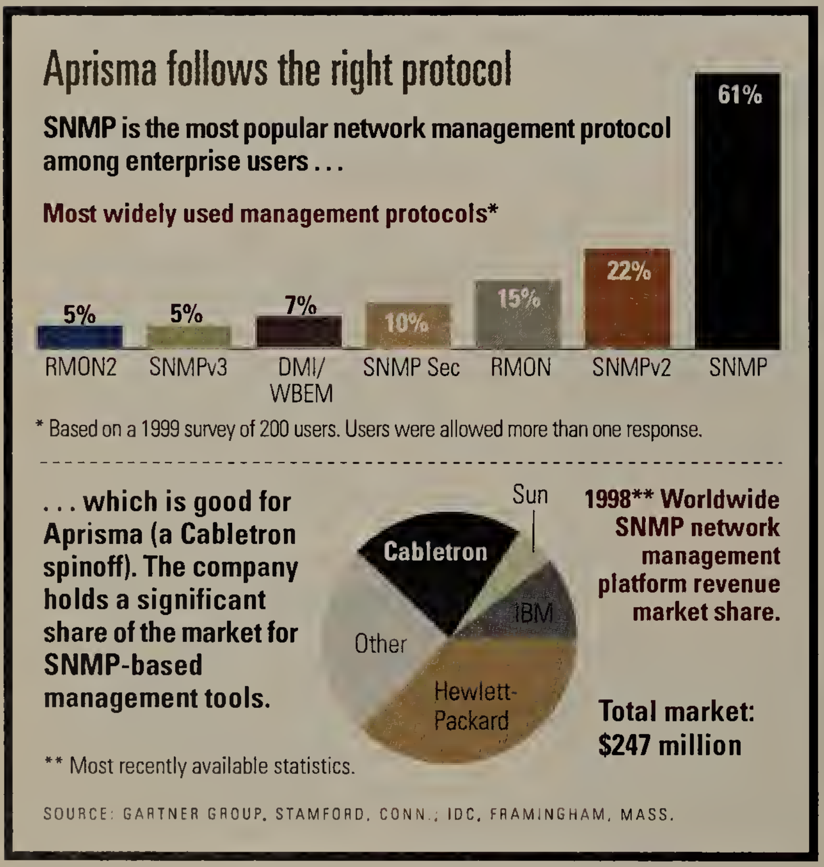
For instance, the software will use artificial intelligence to model the effects of a network crash — determining which users would be most affected and what the outage would mean to the business.

Also, performance problems could be analyzed to see if the problem was caused by the application, server or network. Today, multiple management packages would be needed to correlate those types of events, executives say.

Aprisma is adding the advanced technology to take on much larger competitors, such as Hewlett-Packard, Tivoli and Computer Associates, which have considerably greater mind and market share. Indeed, Spectrum had overall sales of $64 million in 1998, says San Jose research firm Dataquest, as compared to market leaders Tivoli and HP, which had sales of $201 million and $209 million, respectively. Now that Aprisma is a separate entity free of Cabletron's shadow, it will move more innovative products to market faster, a number of analysts believe.

Michael Skubisz's Aprisma is gearing up to take on HP, Tivoli, CA and others with Spectrum 6.0.

Spectrum was usually judged in terms of its hardware-based Cabletron parent, says Valerie O'Connell, an analyst at the Boston consultancy the Aberdeen Group. This will change, she says, but Spectrum must actively continue to promote itself as being an e-business management supplier, she says.



Aprisma follows the right protocol

SNMP is the most popular network management protocol among enterprise users . . .

Most widely used management protocols*

* Based on a 1999 survey of 200 users. Users were allowed more than one response.

. . . which is good for Aprisma (a Cabletron spinoff). The company holds a significant share of the market for SNMP-based management tools.

1998 Worldwide SNMP network management platform revenue market share.**

Total market: $247 million

** Most recently available statistics.

SOURCE: GARTNER GROUP, STAMFORD, CONN.; IDC, FRAMINGHAM, MASS.

Aprisma is moving in the right direction by supporting multiple vendors' products, say John McConnell of McConnell Associates, a Boulder Co.-based consultancy. Aprisma is targeting large enterprises and massive service providers that need to be able to manage vast networks quickly. Because of its relationship with companies such as Cisco, whose products it supports natively, the company has been steadily becoming a credible independent software vendor free of parent Cabletron's influence.

Spectrum 6.0 has a feature that will model and benchmark the performance of applications such as Microsoft Exchange and Oracle.

Currently the package can benchmark only network devices. Once a package is benchmarked, if the application performance is violated, an alarm appears on the management console.

To keep pace with next-generation Web hardware technology, the firm also claims Spectrum can benchmark and monitor 20 new optical and broadband network devices, such as the Cisco IGX and MGX series switches.

Aprisma is adding a Web browser-based console to Spectrum to complement the current PC console. There will also be a SQL-based database, which will allow easier access to management information than the current proprietary database. Spectrum will also have a Common Object Request Broker Architecture-based API that will let IS staff tie its information to or pull information from third-party products, such as Concord's performance reporting application. This capability means users can look at a single console to view network and systems activity.

Closing Spectrum gaps

Opening Spectrum up to other network monitoring packages may address some gaps in the product's features that users have found frustrating. One such user is Mike Wiseman, support engineer at the University of Toronto.

Wiseman says he has been pleased with Spectrum's performance managing his 20,000-user LAN and WAN. However, he says he's wanted to generate Web reports with charts that he can share with other departments, but has been unable to do so.

In addition to the third-party ties, Spectrum now can recognize and list the logical connections between devices. Previously, it could only view a network's hard-wired connections, which kept it from mapping connectivity such as ATM permanent virtual circuits.

Among the key Prism features coming to Spectrum will be the ability to look at network performance not just in terms of devices and applications, but in terms of the overall e-business. For example, the Spectstroserver analysis engine, which handles the artificial intelligence for Spectrum, will be modified to predict the business impact of a crashed Web page or e-mail server.

Moreover, end users in a workgroup can receive automatic notifications if a server is down. In turn, Spectrum will let an IS staff know if a department with lost services is a crucial business workgroup or not. Further adjustments to the Spectrum analysis engine will let it break down a problem, and tell if it is being caused by a server, a firewall or a router misconfiguration.

While Prism technology is slated for release before year-end, it is unclear if it will be rolled out separately or bundled with Spectrum.

Spectrum 6.0 will be available in May; pricing will start at $25,000 for the branch manager version and $100,000 for its enterprise manager. It runs on Windows NT and Solaris.

Aprisma: www.aprisma.com

www.nwfusion.com

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Tutorial: Find out what's at the core of Spectrum.

Training: Sign up for Aprisma's Spectrum training.

DocFinder 7933
find it online

Last mile,
continued from page 101

frequency division multiplexing (VOFDM), which came along as part of the Clarity deal. VOFDM delivers two-way data, voice and video communications over the air at high speeds. Texas Instruments and Samsung have announced they also plan to support VOFDM.

BROADBAND ACCESS BLITZ
Second in a three-part series.

On the DSL front, vendors are pushing to extend the reach of the technology to more customers. DSL comes in many flavors, most of which slow down as the length of the phone line increases. Depending on the flavor, most DSL services peter out somewhere between 12,000 and 24,000 feet.

Equipment makers and service providers are ready to pounce on a promising new variety called symmetric high-bit-rate DSL (SHDSL). It is a variant of HDSL2, which is locked in to supporting 1.5M bit/sec downloads and uploads at up to 12,000 feet.

SHDSL is unfettered from having to provide 1.5M bit/sec, and can support varying degrees of high-speed service depending on the distance. It does this without disrupting services running on nearby wires in phone company cables.

Vendors are also starting to boost the speed of the DSL flavor that requires no service technician visit to customer homes. That type of DSL, known as G.Lite, is being pushed from 1.5M bit/sec downloads to 3M bit/sec downloads by Copper Mountain, which makes carrier gear. Copper Mountain says customer G.Lite modems made by 3Com, Efficient Networks and Cayman Systems can handle the extra speed. The refinement of the technologies will continue, but the ingenuity of service providers and their ability to give customers what they want will determine the success or failure of broadband in the last mile, says Ray Keneipp, an analyst with Burton Group.

(Next week: What it's like to use the technology.)

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A litany of litigation

Microsoft's legal battle has been a long and winding road over the past several years.

August 1996
Netscape asks the Department of Justice (DOJ) to take action against Microsoft, alleging the coercion of vendors into using Microsoft's Web browser.

October 1997
Sun sues Microsoft for allegedly failing to stick to its Java licensing agreement.

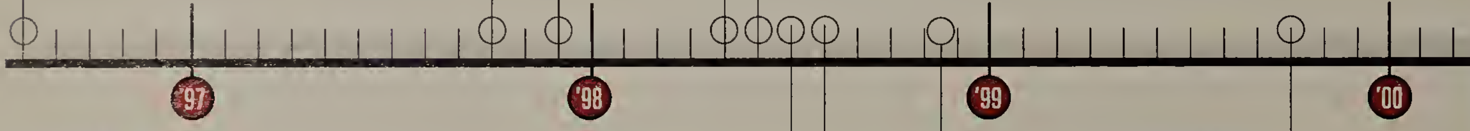
The DOJ asks a federal court to hold Microsoft in contempt and fine the company $1 million daily for requiring PC makers to include Internet Explorer in Windows 95.

AP PHOTO

December 1997
The DOJ hires antitrust attorney David Boies as a consultant in the Microsoft case.

May 1998
Sun sues to keep Microsoft from shipping Windows 98, which Sun says contains a Java version incompatible with Sun's version.

June 1998
U.S. Sen. Orrin Hatch (R-Utah) announces plans to conduct hearings by the Judiciary Committee to examine Microsoft's anticompetitive activities.



July 1998
The DOJ motions to force Bill Gates to participate in two days of depositions.

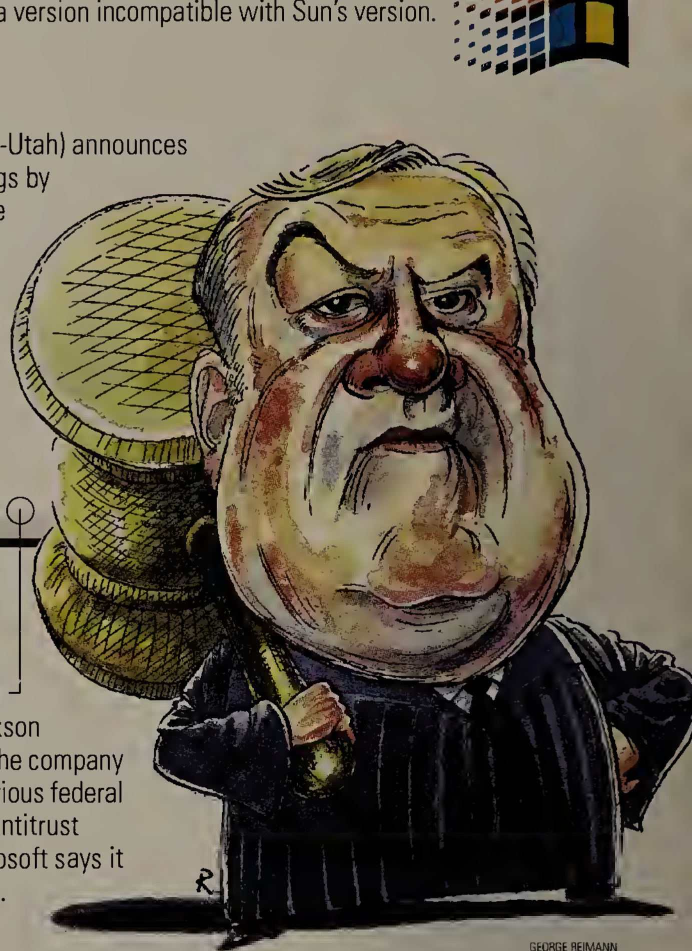
AP PHOTO

August 1998
U.S. District Court Judge Thomas Penfield Jackson orders Microsoft to turn over Windows 95 and 98 source code to the DOJ.

November-December 1998
Testimony from executives at Sun, Intel and Apple alleges that Microsoft plotted to split up the Internet software market and made threats to competitors.

October 1999
Judge Jackson issues his findings of fact determining that Microsoft has a monopoly in the PC operating system market.

April 2000
Judge Jackson rules that the company violated various federal and state antitrust laws. Microsoft says it will appeal.



GEORGE REIMANN

Microsoft,
continued from page 1

and the other on software applications such as Office and Internet Explorer, the Web browser that was at the heart of the antitrust case filed nearly two years ago.

The government will also seek behavioral remedies that will restrict the company's business practices during an appeals process. The Justice Department also asked that the two new companies be barred from reuniting for 10 years, and that Chairman Bill Gates and other executives be barred from owning stock in more than one of the new companies.

The last major government-induced corporate breakup was in 1984 when AT&T was deemed a telephone monopoly and divided into eight companies.

Microsoft, which is expected to appeal, responded to the ruling quickly.

"For months, the government and a handful of our competitors have been repeating that Microsoft should be broken up. But no matter how many times it's repeated, it's still unreasonable," said Steve Ballmer, Microsoft president and CEO in a statement. "I remain proud of the work this company does. We do not believe we have violated the law, and the Court of Appeals has yet to consider this case. We also believe we have an obligation to our shareholders, employees, partners and customers to stand up for what we believe is right.

"Microsoft has exciting plans to develop a broad array of next-generation software products that will take computing to the next level, but those plans are imperiled by the extreme regulation proposed by the government," Ballmer added.

Attorney General Janet Reno also told the Associated Press: "This is the right remedy for the right time. Our proposal will stimulate competition, promote innovation, and give consumers new and better choices in the marketplace."

Jackson can now accept all, part or none of the proposal. Microsoft will give its response and present its own proposal on May 10. The Justice Department will respond to Microsoft's proposal on May 17. On May 24, Jackson will hold a formal hearing in Washington, D.C. before retiring to draft his ruling, which could take a few weeks.

The government lays out a draconian scenario for dealing with Microsoft, and some IT executives are concerned that they will eventually be the ones to suffer.

Microsoft's corporate customers say that despite their well-known complaints about often buggy or insecure software, they rely on Microsoft's integration of its range of products for desktops, servers and the Internet.

Users wonder if the parts of a dismantled Microsoft could equal the sum of what exists now. "I can't see a breakup making the products any better," says Jeff Allred, manager of network services for the Duke University Cancer Center in Durham, N.C. "Who is there to fill in the gaps in competition? Apple isn't focused on my corporate network. Linux will take a few more years to develop. What happens to me in the interim? Competition is always good for the consumer, but in this case, how long will it take for me to see advantages?"

According to a recent Giga Information Group/Sunbelt Software survey of more than 1,000 companies worldwide, 92% of respondents said they would continue to buy and install Microsoft Windows-based products.

"Put yourself in my shoes," says Greg Scott, IS manager for Oregon State University's College of Business. "I have to provide IT services for a mid-size to large enterprise. What I want is consistency and reliability — I don't like a lot of surprises. The operating system is more dependent on back-end systems, so how can you break those apart and still have an effective system?"

But some say integration is a double-edged sword that enterprise customers should look at with a critical eye.

"Indeed, there is benefit in products working together," says David Smith, an analyst with Gartner Group in Stamford, Conn. "But the costs may come down the road when you don't have the best products or you have ones that are not easy to support."

There also is concern that enterprise consumers may be getting the short end of the legal stick.

"I think the DOJ is more focused on the consumer market and less so on the corporate computing world," says Dwight Davis, an analyst at Summit Strategies in Kirkland, Wash. "A breakup throws a big curve into IT roadmaps. The corporate world is not clamoring for a breakup. They are a conservative bunch and don't like uncertainty."

Staff writer John Cox contributed to this story.

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Backspin

Testing Metallica's mettle

"[Metallica's] last tour was a metaphor for rock bloatedness" —

Ben Ratliff, *Rolling Stone*, 1999.

A few weeks ago I wrote about Napster, the system for sharing MP3 files across the Internet, and the idiocy that is surrounding it (*NW*, April 3, page 102).

Well, on April 13 the heavy metal rock band Metallica, along with E/M Ventures and Creeping Death Music (honestly, I didn't make that up), jointly filed suit against Napster, Inc., the University of Southern California, Yale University and Indiana University.

MARK GIBBS

Metallica and friends own the copyrights of the recordings and compositions created by the band. The suit alleges "the co-defendants committed continuing copyright infringements, made unlawful use of a digital audio interface device, and committed violations of the Racketeering Influenced & Corrupt Organizations Act."

Metallica says "Napster has devised and distributed software whose sole purpose is to permit Napster to profit by abetting and encouraging the pirating of the creative efforts of the world's most admired and successful musical artists. Facilitating that effort are the hypocritical universities and colleges which could easily block this insidious and ongoing thievery scheme. The last links in the chain are the end users of the stolen musical works, students of these universities and others who exhibit the moral fiber of common looters loading up shopping carts because 'everybody else is doing it.' "

Let me digress for a second: I assume the phrase, "the world's most admired and successful musical artists" is meant to apply to artists in general rather than Metallica alone. While the band has enjoyed enormous popularity, it is dramatically unoriginal (ever heard of Black Sabbath and Deep Purple?) and its members are hardly virtuosos even in their own genre. Go listen to Motörhead for a lot more energy, Lynyrd Skynyrd for a lot more flair, and Thin Lizzy for a lot more style.

So let's see ... well, my first problem with this suit is that the logic involved would allow, say, Bank of America to sue Ford for producing cars because they enable bank robbers to stage getaways. Or how about overweight people suing their local supermarkets for supplying Ben & Jerry's ice cream and making highly caloric food available to them?

In a statement, Metallica drummer Lars Ulrich said: "With each project, we go through a grueling creative process to achieve music that we feel is representative of Metallica at that very moment in our lives. We take our craft, whether it be the music, the lyrics, or the photos and artwork, very seriously, as do most artists. It is therefore sickening to know that our art is being traded like a commodity rather than the art that it is."

Hold on bucko — your music is a commodity! Isn't a band that has sold more than six million records dealing with a commodity? And to describe your product as "art" in such wounded terms ... well, isn't that just a little bit egotistical? Then again, it is heavy metal.

What really concerns me about this suit is not only the continuing attacks on Napster, which I think are groundless and unethical (apart from being logically and conceptually absurd), but also the inclusion of universities as co-defendants! What absolute idiocy and opportunism!

Why don't Metallica et al take out a suit against the actual Napster users? You don't know who they are? Then hell, let's apply the principle they are apparently working with and include everyone who uses the 'Net, as well as all the ISPs that are involved in the Napster exchanges as well as Cisco, Microsoft, Sun, etc. — yep, there's a pretty big list.

Come on Metallica, let's test your mettle. Go for the real culprits and leave the bystanders alone. You can't? That's life.

Tales of idiocy to nwcolumn@gibbs.com.

'NET BUZZ

The latest on the Internet/intranet industry

PAUL MCNAMARA

If the stock market nausea of the past few weeks has demonstrated anything lasting (a debatable point) it may be that technology investors have finally had their fill of fanciful business plans and amateurish execution. In other words, the screw-ups are being handed their walking papers, particularly among the dot-coms.

This topic was kicked around here last week when the folks from **Segue Software** dropped by for a chat. Segue makes a living load-testing Web sites and e-business applications for heavyweights such as **AOL, AT&T, Cisco, IBM** and **Lucent**, as well as a raft of lesser-known Internet entities. Segue sees the end of any e-commerce honeymoon as an opportunity to make hay because its products and services are designed to prevent the kinds of Web meltdowns that can ruin a young company's reputation and crimp its ability to raise life-sustaining capital.

"In order to become viable, you need to get to market quickly and you cannot have any downtime," says **Tom Boyle,** vice president of marketing at Segue. "And on one level, you'd like to see in your business plan some kind of definition as to what you're going to do to prove that your product scales."

Segue will be glad to help on that score, of course. Before the year is out the company intends to add real-time application monitoring and a hosted version of its products, both of which make sense given the continued explosion of e-commerce start-ups.

"I don't believe that somebody like **Wal-Mart** is going to come and log on to our hosted service and run a test," acknowledges **Andy Sirois,** Segue's vice president of product management. "But it's likely that a small company would do that."

And it's the small companies in particular that have to guard against swinging and missing. One strike may be all they get these days.

Before our paternalistic leaders in Washington trot out even one more poll-driven plan to protect us from the evils of the Internet, perhaps they should consider getting their own house in order first.

According to a report in *Federal Computer Week*, the **U.S. Department of Defense** has taken a rather novel approach to guarding some of the nation's military secrets: hiding them in plain sight on public Web sites. (Hey, what hacker or spy would ever think of looking there?)

The situation came to light after a unit of reservists called the Web Risk Assessment Team surveyed 800 Defense Department public sites and found up to 1,300 so-called "discrepancies." Included were reports on computer system vulnerabilities, detailed maps of defense facilities, signals used to determine whether a military aircraft is "friend" or "foe," and — get this — more than 10 instances where honest-to-goodness war plans were posted.

I don't know about you, but this kind of thing concerns me more than the prospect of some e-commerce site tracking my buying habits without my knowledge.

Just when you think the Internet couldn't possibly get any sillier, here is "Yet Another Pointless Web Page" courtesy of Network World Fusion guru **Adam Gaffin**:

"Cable ties are those little serrated plastic strips with a loop at the end that you can use to tie together everything from electric wires to plastic tubing," Gaffin tells us. "In other words, they're completely boring, generally only coming to your attention when you need to open one up, only you don't happen to have a pair of scissors handy. But that hasn't stopped some German company from setting up an entire Web site about them." The site features photos, sound clips, a "1001 uses" page (you can add your own, naturally) and translations for "cable ties" into every language imaginable.

Don't lie. You're going to check it out: www.xx.net/cabletiefanpage.

You say you can top that one? Make my day. The address is buzz@nww.com.

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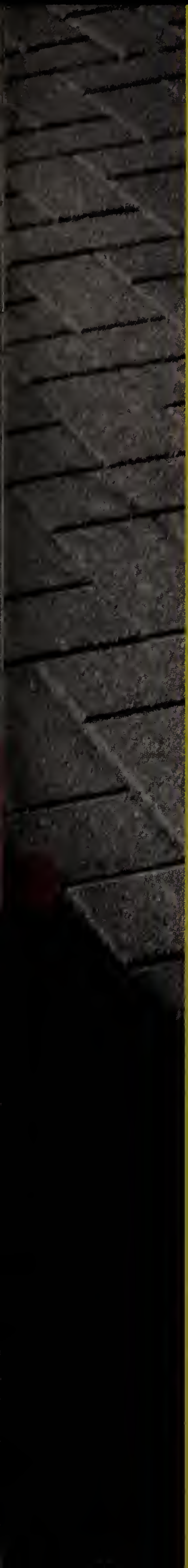

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I am the language

that articulated

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paycheck you're earning,

and swordfish you'll have

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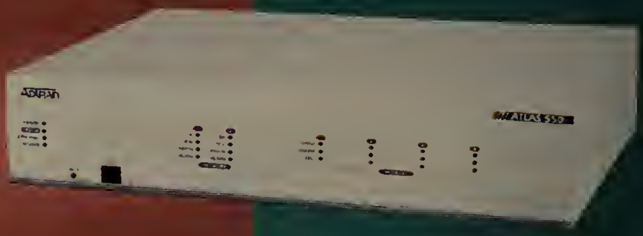

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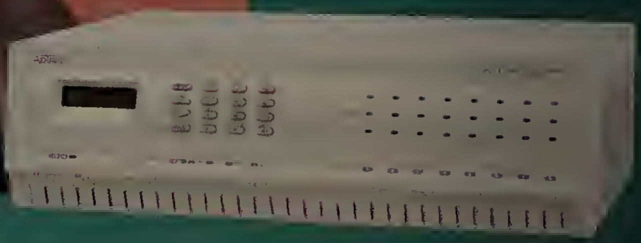

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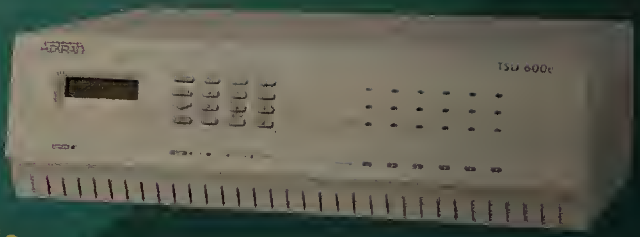

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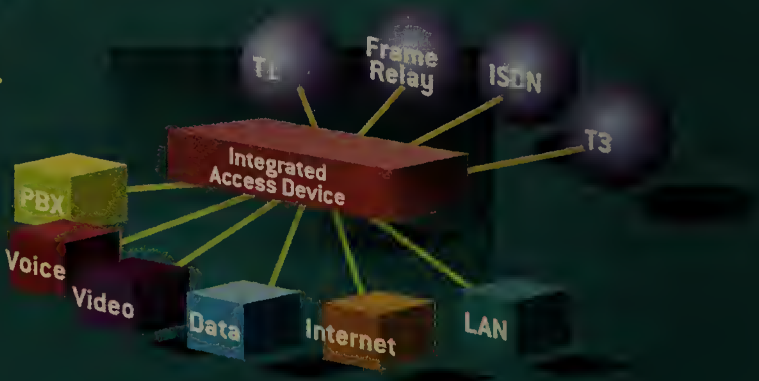

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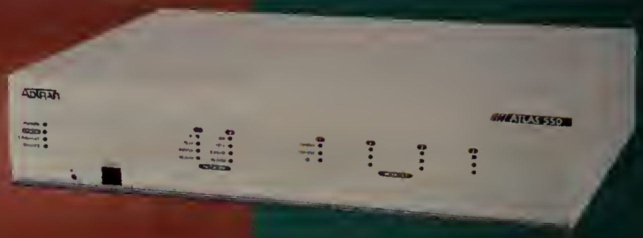

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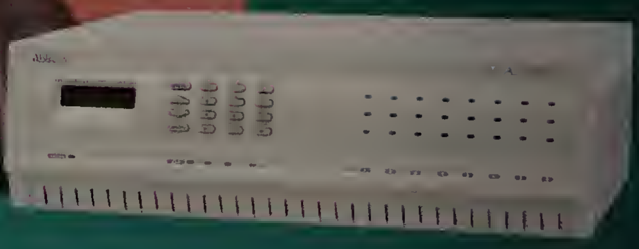

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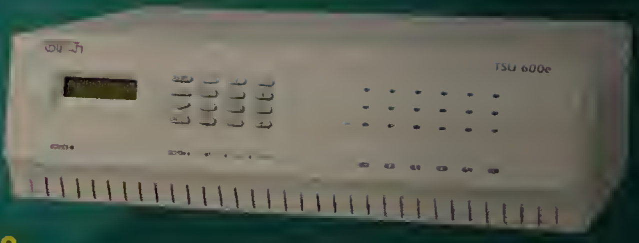

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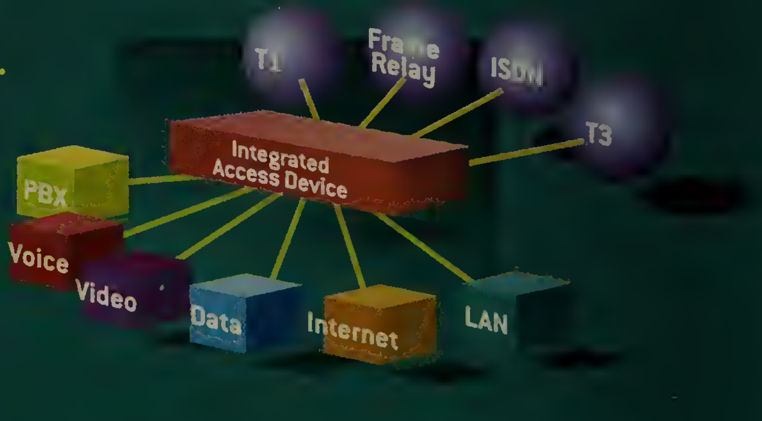

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